



# The Hyderabad Construction Coy., Ltd.

(Incorporated under the Hyderabad Companies Act. IV of 1320 F.)

## PROPOSAL FOR PAPER INDUSTRY IN HYDERABAD STATE.



# The Hyderabad Construction Coy., Ltd.

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## Copy of the Application and Proposals

in connection with

## Paper Industry

Submitted to

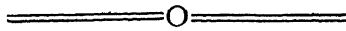
Secretary, Commerce & Industries Dept.,  
H. E. H. the Nizam's Govt. Hyderabad- Dn.

Dated 7th October 1936.

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# The Hyderabad Construction Coy., Ltd



ABID'S ROAD,  
Hyderabad, Dn.

*Dated 7th October 1936.*

**THE SECRETARY,**  
**Commerce and Industries Department,**  
**'H. E. H. The Nizam's Government,**  
**Hyderabad-Deccan.**

**Subject :— PAPER INDUSTRY.**

DEAR SIR,

In continuation of our letter No. 941 dated 21st September, 1936, we have pleasure in submitting herewith our proposals in connection with the formation of a Paper Factory at Sirpur in Adilabad District.

The preparation of a complete scheme has taken us some time ; but judging from the valuable datas and informations that are embodied in the proposals we trust the Government will appreciate the pains that have been taken by us.

The services of Mr. W. J. Alcock, Consulting Engineer were obtained for working out the technical details and cost of production and for drawing up the specifications for the machinery. Mr. Alcock is a well-known figure in Paper Industry and is Consulting Engineer to Titaghur and Bengal Paper Mills. He has just completed the design and lay out of Mr. Birla's Orient Paper Mills. Mr. Alcock has paid a visit to the proposed site of the Factory at Sirpur to study the local conditions. He has also visited the Bamboo areas, the Coal Mines of Belampalli and stayed for some time at Hyderabad to have a thorough idea of local conditions. Along with his note he has drawn up the complete specifications in detail and his estimate is based on the prices of machinery of best British make. In the figures given by him he has included the cost of packing, shipping, insurance, freight and erection at site and the estimate is comprehensive in all respects.

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In the preparation of this scheme the Hyderabad Construction Coy., Limited, has undergone considerable labour and expense besides obtaining the best technical and expert advice available. The local areas had to be surveyed and the various means and possibilities of the supply of raw material and water had to be investigated in great detail. Local and outside financiers had to be sounded for financing the scheme and quotation for machinery had to be called from all over the world to get an exact idea of the prices of machinery. The following pages are the result of systematic and scientific work of several months

The proposals in general comprise of the formation of a Joint Stock Company for the manufacture of Pulp and Paper chiefly from bamboo grown in the Districts of Adilabad and Asifabad. The Authorised Capital is proposed to be O. S. Rs. 50 lakhs and Issued Capital O. S. Rs. 45 lakhs. Of the Issued Capital, the Hyderabad Construction Coy., Limited, will subscribe Rs. 5 lakhs, the Directors and other Associates of the Hyderabad Construction Coy., Limited, will subscribe or underwrite another ten lakhs, and the Government is requested to partake in the scheme by subscribing Rs. 10 lakhs towards the Share Capital. No particular difficulty is anticipated in getting the balance amount subscribed. But, however, should the Government not feel inclined to participate financially in the scheme, the Hyderabad Construction Coy., Limited, feels that it would yet not be impossible to go on with the scheme, although the difficulties to be surmounted will be multiplied many times.

The factory is proposed to be managed by The Hyderabad Construction Coy., Limited, as Managing Agents, working under a Board of Directors consisting of eight directors two of whom will be nominated by the Government, one by the Hyderabad Construction Coy., Limited, and the remaining five elected from among other shareholders. The Hyderabad Construction Coy., Limited, as Managing Agents will receive 10% of the net profits realised by the Paper Factory as their Managing Agency Commission which fee will cover all expenses incurred by them for the services rendered by their superior Staff, Managing Agents and Directors. The commission will also cover any expenses that the Hyderabad Construction Coy., Limited, may incur

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by way of obtaining expert commercial and technical advise provided that such charges do not amount to more than Rs. 1000 per month

It appears that some recent unpleasant happenings have prejudiced a certain section of the Government against the system of Managing Agency. It is very unfortunate that this should be so. Nevertheless the fact remains, that the most well organised industrial concerns today in India are all run by managing agents. And, among them, the best results are seen of the concerns whose managing agents are well organised firms. Gigantic industries have been built up in India through the efforts of managing agents alone. Certain enough the present industrial development of India would not have seen this day but for its Managing Agency system. Even the Central Legislature of India could not risk to pass any Bill against the Managing Agency system.

Operations of industries by Governments through paid Managing Directors has hardly ever proved successful. Nationalisation or semi nationalisation of industries on socialistic lines is yet too early a conception in Hyderabad. After all, in a place like Hyderabad, the Government is not out to do business and profit by it. We believe, no doubt, that the Government must be anxious to see to the general welfare of the people, but if suitable institutions are selected to function as Managing Agents, and private enterprise encouraged, there is no reason whatsoever why any industrial venture should not be successful.

The Hyderabad Construction Coy., Ltd., is a purely indigenous organisation manned and financed solely by the residents of Hyderabad. The primary object of promoting this Company was to have a well organised institution capable of investigating in a scientific manner various industrial projects of the State from a commercial point of view and to give a practical shape to such of the schemes which prove to be feasible and remunerative. It was further intended that the institution should be able to finance its undertakings from its own revenues and pay at the same time a fairly adequate return to its financiers. It is well known that the working of this concern has been very satisfactory in every respect from the very commencement. The Company has given the best demonstration of the success which a well organised union of finance and intelligence can achieve. But,

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what is more, the Company has trained the youths of the country to shoulder responsibilities in a real business like manner. Today the Company employs more graduates of the Hyderabad Engineering College than even any Government Department. Even outside the sphere of engineering the Government is aware of its achievements in other lines like agriculture, etc. Our results have surpassed all previous attainment.

Of course, Hyderabad is yet too far behind in industrial enterprises and Governments backing and financing is therefore a matter of great importance for the success of any large undertaking. We trust, therefore, that the Government will exhibit its traditional generosity and offer their ever helping hand to a concern like ours in building up a large national industry.

Paper factories are being set up in India in large number, and earlier a factory comes into existence greater are its chances of building up a fair reserve before protective duties are abolished. A very early decision is therefore most respectfully solicited.

Assuring you of the best of our services at all times,

We most respectfully beg to remain.

Your most obedient servants,

**For The Hyderabad Construction Coy., Ltd.**

C. VITTAL RAO,

*Acting Chairman.*

The Hyderabad Construction Coy., Ltd.

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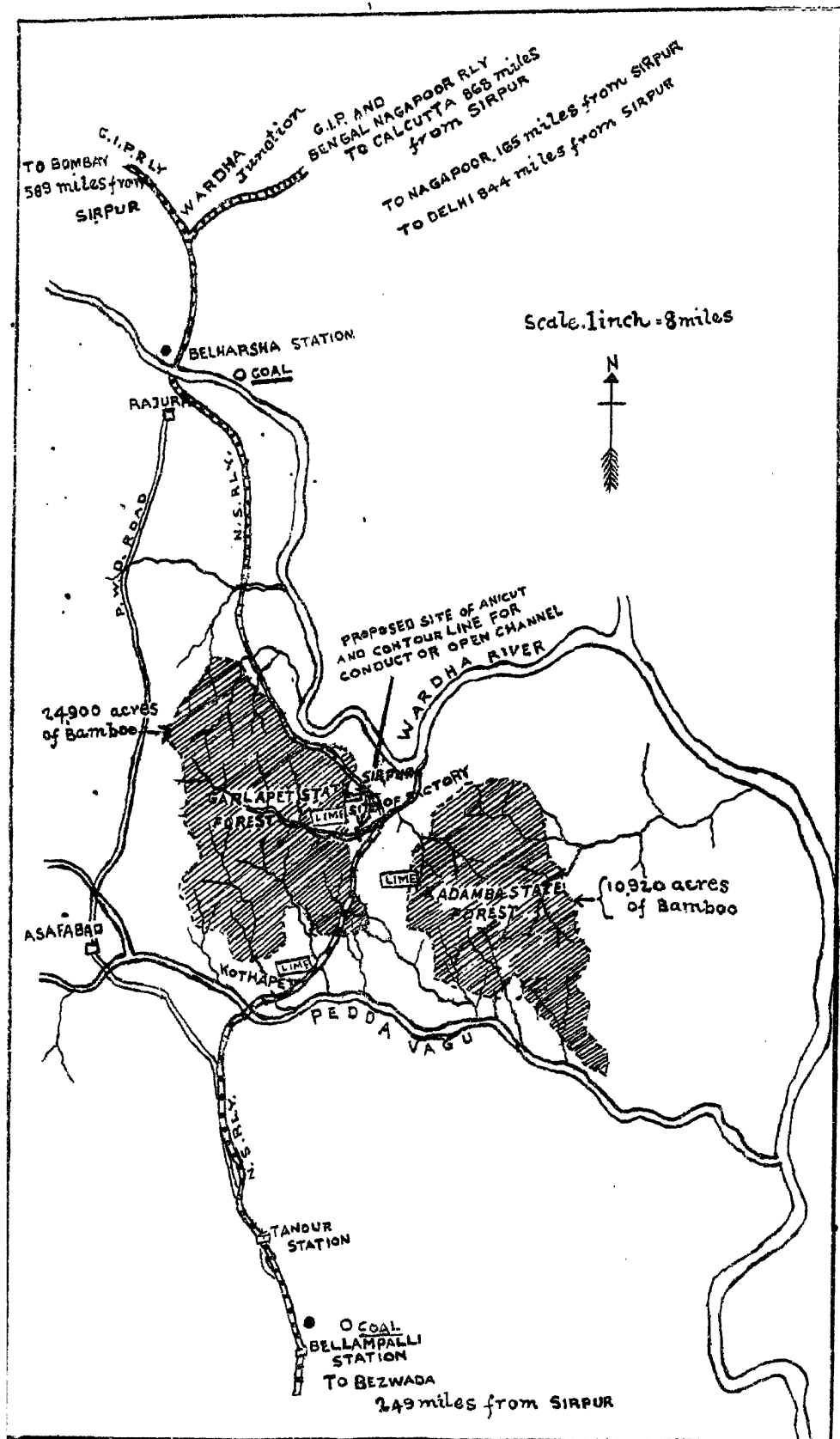
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**NOTE**  
**ON**  
**PULP AND PAPER INDUSTRY**  
**IN**  
**HYDERABAD STATE.**

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## NOTE ON PULP AND PAPER INDUSTRY IN HYDERABAD.

### I. GENERAL

The Paper Industry in India is enjoying protection since the year 1925 and the period of protection is due to expire by the end of March 1939. Before protection, imported paper in India was subjected to a duty of 15% Ad Valorem. But, after this, with the exception of news print and certain other special classes, practically all writing and printing paper was protected by a duty of one anna per pound *i. e.* Rs 140 per ton. Subsequently in 1932 the revenue and protective duty of paper was increased by another 25% as a result of general surcharge levied in that year. Accordingly the following duties are in force at present :—

Class.	Nature of duty.	Rate of duty.
1 Wood Pulp.	Protective.	Rs. 56-4 per ton.
2 Paper and papiermache - Paste Board, Mill Board Card Board, Etc.	Preferential Revenue.	30% Ad Valorem and 20% Ad Valorem for British Manufactures
3 Printing Paper All classes with less than 70% mechanical wood pulp.	Protective.	1½ anna per pound.
4 Printing Paper all classes with not less than 70% mechanical wood pulp.	Revenue.	25% Ad Valorem.
5 Writing Paper of all classes.	Protective.	1½ Anna per pound.
6 News Print.	Revenue	25% Ad Valorem.
7 Stationery and Miscellane- ous.	Preferential Revenue.	30% Ad Valorem. 20% Ad Valorem for British Manufac- tures.

Paper Industry brightened up as a result of these protective duties and the surcharge levied in 1932 gave it a further impetus. As a result of this policy the state of affairs of some of the leading mills

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in India is as follows :-

Name of Mill.	Paid up Capital Rs.	Reserve Fund.	Last Dividend.	Nominal Value of Shares.	Market Quotation for Share.
Bengal Paper Mills....	9,00,000 P	67,18,165	25%	25	111
Indian Paper Pulp ...	30,00,000	40,60,160	5%	100	171
Titaghur ...	7,55,955 P	1,49,87,286	55%	2-8-0	24-14-0

Companies Marked P. have Preference Shares.

Besides the above there are other smaller mills and several more have either been projected or are under construction. The latest additions are The Mysore Paper Mills, The Orient Paper Mills and the Rohtas Industries Ltd. In the case of the Mysore Mills over Rs. 80 Lakhs were subscribed against a call of Rs. 25 lakhs and now, before the factory has even been erected, the shares stand at a premium of 75% over the paid up amount. The Orient Mills have published their Memorandum of Association only with a note that all the shares have been privately subscribed and no applications from the public are invited. This is at a stage, when the promoters of the Orient Mills have not even decided the situation of the mill. The Rohtas Industries which are a combination of Sugar, Cement and Paper, have offered their ordinary shares of Rs 10. at a premium of Rs. 10-8-0 and Rs. 100 preference shares at a premium of Rs. 45.

It all goes to show that there is a boom in the Paper Industry and capital is flowing wherever there are reasonable prospects of efficient management and facilities for the development of this Industry.

It is true that the Industry is bound to have a set back if the protective nature of the duties is removed. Well informed circles do not anticipate that the Central Legislature would ever agree to the abolishing of these duties and it is hard to believe that the Government of India would force such a measure against the popular wishes of the Central Legislature.

Taking an over cautious attitude it is better to reckon on the eventuality when protective duties will be abolished. In such an event the present duty of Rs. 175 per ton may come down to 20% Ad

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Valorem which would mean a reduction of about Rs. 100 per ton. The present price of paper is in the vicinity of Rs. 500 per ton at an average. Minus protection this will go down to Rs. 400. With the influx of various new mills the price might probably go down still by another Rs. 25 so as to bring the selling price down to Rs. 375 per ton. Any further reduction in price does not seem probable as that would mean that several mills whose cost of production is about this, shall have to shut down.

Having determined the lowest level which the price of paper can touch it is worthwhile examining the prices of raw materials that other factories have to pay and their situation in regard to marketing centres. Of course in the case of most mills Bamboo is replacing rapidly the Sabai grass or any other kind of pulp but there is hardly a mill where bamboo is delivered at the site of the factory at less than Rs. 20 per ton. The only factory which obtains its bamboo at a cheaper rate is the Mysore Factory where the Government has undertaken to deliver bamboo at the rate of B. G. Rs. 12 per ton. But, as against this, they will have to pay about Rs. 17 per ton towards coal which they will have to import either from the Singareni Collieries or Bengal. The Bengal Paper Mills which obtain coal at about Rs. 7 per ton have to spend no less than Rs. 20 per ton for bamboo. The Hyderabad Paper Factory which is proposed to be located at Sirpur has a unique feature where bamboo is available at a maximum price of Rs. 12 per ton on the basis of a royalty of O. S. Rs. 3 per ton, and coal at Rs. 5-2-0 per ton. Besides this, like all other industries in the State, it will be protected to the extent of 5% on its production for local consumption and the industry for the present at least will be free from any income-tax.

In India today, the production of various mills has come up to 45,000 tons per annum. There is still an import of 100,000 tons in India of which at least 30,000 tons can be manufactured from bamboo. The proposed mills and those under reconstruction have a total capacity of 20,000 tons. There is yet a balance of 10,000 tons of which the proposed Hyderabad Mill can claim to have its share. Of course, if started immediately, it can look to a market of almost 30,000 tons.

Taking all classes of paper into consideration nearly 2,000 tons of paper are consumed in the Hyderabad State. Of these at least

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1500 tons can be manufactured in the proposed Factory. With the spread of education this consumption is certain to go up. But it would not be practicable to run a factory with its output limited to local requirements alone. The smallest factory which can efficiently work and face the existing keen competition must have a production of 5 to 6 thousand tons. This being the case the proposed factory has been designed for an output of 5 to 6 thousand tons per annum. The capital expenditure is estimated at O. S. Forty-five lakhs. It can be brought down to O. S. Rs. 40 lakhs if working capital is borrowed from Banks. It does not seem possible that any lesser capital can adequately meet the requirements. The Mysore Factory which has started with a capital of B. G. Rs. 25 lakhs only is said to be in need of further capital as various minor details of equipments were not estimated for in the beginning. Besides, the present estimate has been made for paper machines of best British make.

In brief, the proposals therefore are to form a Joint Stock Company with an authorised capital of O. S. Rs. 50 lakhs and an issued and subscribed capital of Rs. 45 lakhs. The Company to be managed by the Hyderabad Construction Coy., Ltd., as Managing Agents working under a Board of Directors constituted of two-nominees of the Government one of the Hyderabad Construction Coy., Ltd., and five elected from among other share holders. The Government to subscribe a sum of Rs. 10 lakhs, the Hyderabad Construction Coy., Ltd. Rs. 5 lakhs and the balance of Rs. 30 lakhs to be called from the public. Preference to be given in allotment of shares to the bonafide subjects of H. E. H. the Nizam.

No special difficulty is anticipated in getting the capital of Rs. 30 lakhs from the public but we feel that before offering the shares to the public the Hyderabad Construction Coy., Ltd., must have another Rs. 20 lakhs under-written, and rely upon the public only to the extent of 10 lakhs. Although with a certain amount of canvassing it seems feasible that further sums of 20 to 25 lakhs can be got under-written in case the Government does not choose to participate, but it seems desirable both in the interest of the Industry and the shareholders that the Government should hold a reasonable block of shares so as to indicate its direct interest in the Industry. Such a participa-

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tion will be a matter of advantage to the Industry, to the Share-holders and the Government.

The Government stands to lose about Rs. 35,000 a year towards Custom Revenue as a result of establishment of this factory. As against this, the Government will receive a sum of Rs. 40,000 towards Royalty on Bamboo. Besides, the N. S. Railway system will have a direct additional goods traffic of  $2\frac{1}{2}$  millions ton miles and the Government will receive about Rs. 5,000 extra royalty from Coal Mines. The indirect revenues that the Government will receive are difficult to calculate and the advantages of having a large industry in the State and the employment therefrom are too obvious.

### **2. RAW MATERIALS.**

#### *(a) Bamboo.*

According to Bulletin No. 4 published by the Commerce and Industries Department the total area available in Kadamba and Garlapet Blocks is about 36,000 acres. Of this on a four year rotation basis 9,000 acres of bamboo will be available annually. The yield per acre of bamboo assessed by the Forest Officer is 4.45 tons. Our own estimate of the yield at present is more in the vicinity of 5 tons per acre due to accumulation of stock since the publication of the report. However, taking only the lower figure into consideration about 40,000 tons of bamboo will be available in the first rotation and if the whole of this 40,000 tons are consumed annually in that rotation, then the second rotation will yield on a four year growth basis 25,000 tons per annum. What actually happens is that a factory with a capacity of 5,000 tons will consume at the most (allowing  $2\frac{3}{4}$  tons of bamboo per ton of paper) 13,750 tons a year, which is just a little over half only of the yield of the 2nd rotation. In other words even if the consumption of the factory is increased to 25,000 tons of bamboo a year then the areas will always hold further reserve of more than a year and a half's supply i. e. 40,000 tons.

Flowering of bamboo is however commonly regarded as a source of great danger to factories depending upon bamboo for the pulp. This matter has been investigated by the Forest Department and the Paper Expert of Hyderabad State in great detail and it has

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now been proved beyond doubt that flowered bamboo remains fit for atleast four years for the purposes of paper manufacture even after flowering. Taking for granted that a time may come when the whole of both the Kadamba and Garlapet areas will get flowered it will still be possible to get bamboo for quite four years from these areas for the Factory. After that, Siddeshwar, Manikgarh, Tirani and Ralli areas can supply large quantities although greater expenses will have to be incurred. It is also likely that the Tandur and Chopdi blocks which have already flowered and are reviving again will be ready for exploitation in case of emergency and the bamboo from these areas can be railed without undue expenditure to the site of the factory.

The bamboo obtained from all these area is regarded to be of a very fine quality and our Expert has chosen to design chippers instead of crushers on account of the easy chipping quality of the bamboo. The extraction of bamboo is estimated to cost Rs. 4 per ton. The transport from the interior to rail head is proposed to be done by carts and at Re. 1 per cart, the carting charges will amount to Rs. 2 per ton. From rail head the bamboo will be conveyed to the factory on a light railway system which will be shifted from one area to the other every year. The total cost of laying the track and operating the Light Railway is estimated to work out to Rs. 2 per ton of Bamboo including loading and unloading. Including a Royalty of Rs. 3 per ton the total cost per ton of bamboo delivered at the factory is taken as Rs. 11 per ton. With supervision and overhead charges the final cost is estimated at Rs. 14 per ton or B. G. Rs. 12.

### *(b) Coal.*

Sirpur is conveniently situated about midway between Ballarshah and Belampalli Coal Mines. Coal is a very important item in the manufacture of paper and the stratagic situation of Sirpur is a special feature of the factory. The Belampalli Coal Mines were visited and examined by our Consulting Engineer and the subject is dealt by him at some length in his note. The "Round Coal" has a calorific value of 10,500 to 11,000 B. T. U. S. The ash contents of the coal vary from 18 to 20 percent and are regarded as fairly satisfactory for raising steam.

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The Boilers of the proposed factory have therefore been designed with these features in view.

This coal, according to quotations received from Messrs. Best and Co., can be supplied in a fairly uniform grade at the rate of B. G. Rs. 5-2-0 per ton ex. Sirpur. The cost of manufacture of paper has been based on this quotation.

Coal in Paper Industry is used for motive power as well as for the supply of steam in the process. In the Adilabad District there are fairly good prospects of generating Hydro Electric powers from Kadam and Godavari rivers. It is quite likely that Government at a future date will develop these projects and in that event the factory can guarantee a more or less continuous load of 1,200, 1,500 K.W.H.

### *(c) Common Salt (NaCl.)*

Nearly 4 Cwts. of Common Salt is needed per ton of paper if Caustic Soda and Electrolytic Bleach process is adopted. On the East Coast salt is available at about Rs. 15 per ton and this can be reckoned delivered ex. factory at Rs. 35 per ton.

### *(d) Lime.*

About 10 Cwt. of lime are required for the manufacture of one ton of paper. 10 Cwt. are approximately 20 Cft. Therefore for 5000 tons of paper nearly 100,000 Cft. of lime per annum are needed. Lime stone is available in large quantities in the Sirpur area and in the first few years of the working of the factory the local supply can well be depended upon. At the rate of O. S. Rs. 30 per 100 Cft. the total cost of lime required per annum will not be more than Rs. 30,000 or say O. S. Rs. 6 per ton of paper. Our Consulting Engineer has taken Rs. 15 B. G. per ton but even if lime is imported from Kothapet where large hills of lime stone exist the cost cannot exceed O. S. Rs. 8 per ton. In the construction of Nizamsagar project nearly 5 million Cft. of lime was brought over a distance of 25 to 40 miles at a rate less than this. However, in the estimate of the cost of production, our Consulting Engineers' figure has been maintained as a further margin of safety.

### *(e) Sulphate of Alumina and China Clay.*

China Clay will have to be imported from Chotanagpur and for that reason B. G. Rs. 50 per ton have been allowed in the estimate.

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Sulphate of Alumina is now manufactured in Calcutta from Bauxite and is used by the Bengal Paper Mills. Our Consulting Engineer has estimated it, allowing for Railway Freight, at B.G. Rs. 100 per ton delivered at Sirpur. This Chemical brought by sea and Canal up to Bezwada and railed from there will not cost more than B. G. Rs. 80 per ton resulting in a further saving of B. G. Re. 1 per ton of paper in the cost of manufacture.

### *(f) Sundry Chemicals.*

Sundry Chemicals are mostly of non-Indian manufacture will have to be imported direct from abroad, *via*. Masulipatam and Bezwada. B. G. Rs. 10 per ton of paper has been allowed on this account.

### **3. WATER SUPPLY.**

This is the most important element in the manufacture of paper. Our Consulting Engineer estimates that a million gallons a day is the minimum requirement and if a million and a half gallons are available it would be a very desirable feature.

A million and a half gallons a day means a regular supply of about 3 cusecs or say a consumption of 100 million Cft. per annum. Allowing half as much for evaporation and a years supply in reserve, a storage reservoir of 250-300 million Cft. will be necessary. Malni-Nala which flows close to Sirpur has a catchment of over 50 Sq. Miles and can be depended upon for a run off of about 500 million Cft. per annum. A storage reservoir on this Nala at the site marked in the accompanying map and a conduit or lined contour channel therefrom will not cost more than a lakh of rupees.

If the Government can take up this project and guarantee the factory a regular supply of 3 cusecs the factory will have no hesitation in paying to the Government a sum of O. S. Rs. 2,500 per cusec per annum. This matter well deserves the consideration of the Irrigation and Revenue Departments, as a large supply of water is available for the purpose of irrigation, besides the requirements of the factory.

But should the Government not undertake this scheme then subsoil drainage will have to be chiefly depended upon. The

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geological formation of the sub-stratas at Sirpur is highly porous, mostly layers of Granite and Sand Stone are found. The top surface for a depth of 10' to 15' is a mixture of red earth overlaying moram and disintegrated rock. The subsoil level of water is about 10' to 15' below surface.

Assuming that porous stratas will hold as low as 10% only of water, a square mile of area will contain  $\frac{5250 \times 5250}{10} = 2.7 \text{ M. Cft.}$  of water per foot depth. Or for a depth of 20' below subsoil the quantity available will be 54 M. Cft. Taking the efficiency of drainage as 50% about 4 Sq. Miles of area will have to be drained. The general fall of the valley being 25 ft. per mile, this can be easily done by building a small anicut on the stream and by constructing covered longitudinal and cross drains to lead up the river and subsoil flow into a well. The water from the well may be pumped direct to the factory.

No engineering difficulty is anticipated in carrying out this scheme and there is no doubt that it will be also fairly economical. Water from the well may be carried to the site of the factory in pipe lines or in open conduit and pumped up again to a high level reservoir at the site of the factory. The total estimated cost of the anicut, infiltration drains, well, pipe lines and pumps is estimated at Rs. 96,000 and therefore a lakh of rupees have been provided on this account.

## **4. LABOUR.**

For the supply of 1,500 tons of bamboo a year, the felling, carting, loading and unloading operations will require the services of about 500 men. This much unskilled labour can be easily recruited locally. Besides this, about 300 semi-skilled or skilled labour will be required, and about 250 of that can be recruited within the State. The remaining fifty will have to be imported from other Paper Manufacturing areas of India.

## **5. STAFF.**

In the lower paid staff, Clerks, Time-keepers, Mechanical and Electrical Foremen are easily available locally. But Foremen and Chargemen for digesters, beaters, paper machines, callenders, finishing house, soda recovery plant, electrolytic and bleaching plants,

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etc., say in all a dozen in number will have to be recruited from other paper manufacturing areas, and eventually replaced by local men when they get sufficiently trained.

The General Manager will have to be for the first few years an expert European with a thorough knowledge of paper manufacture. A salary of at least Rs. 2,000 a month will have to be paid to attract a really good person and this has been provided for in the estimate.

It seems necessary to have a European Chief Engineer of good general experience to control the power plant and machinery. For a really capable man, a salary of Rs. 1,000 per month will have to be paid and the estimate provides for this.

General advice on engineering and particularly Civil Engineering matters can be best offered by the Hyderabad Construction Coy., Limited, and any charges on this account excepting travelling expenses, etc., will be borne by the Hyderabad Construction Coy., Ltd., and will be covered by the Managing Agency fee paid to them.

Assistant General Manager, Shift Engineers, Chief Chemist and Assistant Chemist will be mostly local men, and no difficulty is anticipated in recruiting suitable hands. Three Assistant Managers for process are needed and out of these two or possibly three will have to be brought in the beginning from England, recruited from experienced Foremen Class. It would be possible to utilise with advantage the services of the Government Paper Expert on adequate salary if the Government will be kind enough to spare his services.

### **6. SITE AND BUILDINGS.**

The site selected for the factory lies towards the west of the Railway Station. The jungle growth being thick, Sirpur is rather malarious, so it will be necessary to clear a fairly large area around the factory in order to make the locality fairly healthy. The general slope of the land is good varying from 1—200 to 1—50. Disposal of wastewater will present no difficulty and with a fairly efficient drainage system there will be no trouble in making the locality malaria proof.

The formation of the ground is chiefly red earth and moram overlaying disintegrated granite, sandstone and rock. No trouble is anticipated as regards foundation of the buildings both for the factory

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as well as the dwelling houses. The maximum depth of foundation is not likely to exceed 4 to 5 ft.

With abundance of building stone in the surrounding areas, lime close to the site and fine sand within easy reach, building construction would be a very economical proposition. The average cost per Sq. Ft. of covered area including factory buildings is estimated at about Rs. 2-12-0 per Sq. Ft. Our Consulting Engineer has taken a higher figure than this but there is no doubt that considerable saving will be effected on the provision allowed for buildings.

## **7. PROCESS OF MANUFACTURE.**

Bulletin No. 4 recommends Sulphate Process of Fractional Digestion. The Sulphate Process provides somewhat easier bleaching and two or three percent higher yield of pulp. Our Consulting Engineer is of opinion that this is a commendable process where sulphate of soda and bleaching powder are available at a cheap rate and can be depended upon for an uninterrupted supply. Further, both these materials are imported in India from outside. No doubt, in the event of any international complications, these commodities will be difficult to obtain and rise up enormously in prices. Dependence therefore on such materials does not seem a sound proposition. We have therefore adopted the Caustic Soda and Bleaching Liquor process both manufactured from Common Salt. The initial outlay on electrolytic plant is no doubt high, but the resulting saving on that account is estimated at as much as Rs. 23 per ton as compared with the cost of Sulphate of Soda and Bleaching Powder. An extra expenditure therefore of Rs. 2 lakhs is well worth the resulting economy and independence of supplies of chemicals from outside. The Titaghur Paper Mills have recently installed this plant and are advantageously working it. Excepting this difference, the rest of the process remains more or less the same that has been recommended by the Paper Expert of Hyderabad.

## **8. PLANT AND MACHINERY.**

The estimate for plant and machinery provides bamboo preparing machinery, Storage Bins, Digestors to work at a pressure of 130 pounds per Sq. Inch of steam, storage Tanks, Breakers, Super Tremors, Strainers, Pochers. Bleaching Engines, Beating Engines of Hollander

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Type, paper making machine to run on a wire 130 inches wide and 64 ft. long to give finished paper of 120 inches width with necessary wire rolls, spray cutters press and wet felt rolls, vacuum boxes, drying cylinder, smoothing and reeling rolls, callanders, super cylinder machines together with its necessary auxiliaries and a white water seaveall.

The Soda Recovery and Causticising Plant consists of pumps, welded tanks, evaporators, rotary furnace, dissolvers limeslakers, rotary filters, causticisers, and its necessary auxiliaries. The electrolytic bleach and caustic plant consists of 45 cylindrical cells A. C. and D.C. motors, evaporators, pumps, salt dissolvers, soda tanks, chlorine absorption plants together with its auxiliaries. The cost of 5 to 6 thousand tons annual capacity pulp and paper manufacturing plant is estimated at B. G. Rs. 11,89,277. The Soda Recovery and Causticising Plant is estimated at B. G. Rs. 2,37,800 and Electrolytic Bleach and Caustic Plant at B. G. Rs. 2,01,000. All the above are for plant delivered and erected at site complete in all respects and ready for working.

The paper machinery is based on the quotations of best British Manufacture and is complete in all respects.

### **9. BOILER AND POWER PLANT.**

Boiler Plant consists of four drum verticle type water tube boilers each having a heating surface of 6,500 Sq. Ft. working at a pressure of 300 pounds per Sq. Inch and capable of evaporating 30,000 to 37,000 pounds of steam per hour. Super heaters have been designed to work in conjunction with the above to superheat the steam to another 250°.

The necessary sets of boiler house instruments, a 200 ft. by 10 ft. chimney, feed pumps water softening plant and coal crushers are included in the estimate.

The Power Plant consists of one 1,750 kw. turbo alternator running at a speed of 5,000 R. P. M. and working on 250° superheated steam and 290 pounds per Sq. inch pressure. The Alternator has a voltage of 440 and a frequency of 50 cycles. The necessary condensing arrangements, switch board, generator panels and feeder panels are all included in the estimate.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

The total cost of the Boiler and Power Plant is estimated at Rs. 5,66,000 erected at site.

## **10. COST OF PRODUCTION.**

Our Consulting Engineer has worked out carefully the cost of production on the basis of supply of bamboo at B. G. Rs. 12 per ton Ex-Factory (Inclusive of Royalty to Government at O. S. Rs 3 per ton.) and coal at B. G. Rs. 5-4-0 ex-Sirpur. He arrives at a figure of B.G. Rs. 268-13-0 per ton of paper. This figure will be reduced by atleast another B. G. Rs. 9 per ton due to a saving of about B.G. Rs. 8 in lime, and B. G. Re. 1 in Sulphate of Alumina. The cost will really thus come to B. G. Rs. 260 per ton inclusive of average transport charges to the market of B. G. Rs. 25 per ton, supervision at B. G. Rs. 15 per ton, overhead at B. G. Rs. 20 and depreciation at B. G. Rs. 43 per ton. To be on the safe side, however, in the financial forecast the price of paper delivered to the market is reckoned to be B. G. Rs. 270 per ton.

## **11. TRANSPORT TO MARKETTING CENTRES.**

The chief marketing centres will be Madras, Calcutta, Bombay, Hyderabad, Nagpur and Delhi. Out of these it will be most economical to effect transport by sea *via* Bezwada and Musilipatam to Bombay, Madras and Calcutta. This will not only result in lower transport charges for the manufactures of the mill, but will also provide a continuous traffic of a large tonnage of at least 3,000 tons per annum over a length of 249 miles on the N. S. R. System. Our Consulting Engineer feels, that we would be in a strong position to compete with the markets in Ceylon and Malaya States besides the Indian markets. So the existence of a Paper Factory at Sirpur will provide a traffic of no less than 2½ million ton miles to the N. S. Railway System.

## **12. MARKETTING ARRANGEMENT.**

Marketting arrangements should desirably be made with prominent paper dealers in large marketting centres on the basis of commission. For Bombay which will be about the most important market for the produce of this factory the services and help of the Trade Commissioner for Hyderabad may be advantageously made use of.

## **THE HYDERABAD CONSTRUCTION COY., LTD.**

Such an arrangement will not only facilitate marketing but will also keep the factory in touch with the day to day changes in the requirements of the consumers.

### **13. CONCESSION SOUGHT FROM THE GOVERNMENT**

The factory will need a lease of the bamboo areas of the Asifabad and Adilabad Districts for a period of atleast 40 years. It would also be necessary that the Government should undertake on behalf of the Company to acquire such lands from its holders which are needed for the purposes of the factory on the payment of adequate compensation under the Land Compensation Act. The Company should have a right to tap surface or subsoil sources of water supply and should have permission to obtain lime stone and building materials free of royalty and should be allowed to construct buildings, warehouses, set up machinery, lay railway sidings, light railways, overhead electric and telephone lines, underground cables and pipe lines, conduits or open channels, and should be allowed to experiment on Government areas for plantation and improvement of the varieties of bamboos and to cut bamboo from whatever areas they choose and to construct temporary or permanent roads or cart tracks, or huts or buildings at any place in the bamboo areas and to carry on all such operations that will be needed in the interest of the industry and are not calculated to be in any way prejudicial to the interests of the Government or to the inhabitants of the surrounding areas.

The Company in return will pay to the Government a Royalty of Rs. 3 per ton on all air dry bamboos, brought within the premises of the factory subject to a minimum of Rs. 25,000 per annum. Should the Government make arrangements for supply of water to the factory, then the factory will pay in lieu thereof a sum of Rs. 2,500 per cusec metered at the site of the factory upto a maximum of 3 cusecs. If at any time, due to heavy flowering of all the bamboo areas within an economical reach of the Factory, the Factory should be unable to receive its supplies locally, then the Factory on representation to Government should be granted permission to import bamboo from outside the state. The Factory must further have the right to import all its requirements like chemicals, machinery, salt, medicines, instruments, building materials and all other accessories

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needed in the industry for the bonafide use of the factory to be imported free of Customs duty.

The Government should undertake to purchase all its requirements to the extent that the factory is able to cater at reasonably competitive prices.

The Government will not allow any other paper factory to be erected within the districts whose bamboo areas have been leased out to this factory. Further if the demands justify the setting up of another factory in any other part of the State, this factory should be given the first option.

The Government should keep this concern exempted from any taxes levied by the Government of Hyderabad which are not in existence at present.

### **14. CONTROL AND MANAGEMENT.**

The control and management of the proposed Factory will be done by the Hyderabad Construction Coy., Ltd., acting under the directions and control of a Board of Directors. The Board of Directors will consist of two nominees of the Government one of the Hyderabad Construction Coy., Ltd., and five others elected from among other shareholders. The Managing Agents will be responsible under the control of the Board of Directors to manage the entire business of the Factory and will have power to purchase, instal, maintain and operate the paper factory and to negotiate and enter into contracts for the purposes and business of the Company, and to institute, conduct, defend, compromise, and refer to arbitration or abandon legal and other proceedings in which the factory is concerned, and to appoint, employ, discharge and to re-employ experts, engineers, managers, secretaries, solicitors, bankers, agents, brokers, clerks, mechanics, workmen, and other servants of the company and to sign cheques and operate on the Banking Account of the Factory and to draw Balance Sheets and generally to make all such arrangements and do all such acts for the factory as may be necessary or expedient in the interest of the business and are not specifically reserved to be done by the Directors. The Managing Agents in lieu of their services and for their being responsible for the promotion and development of the Paper Factory will receive a remuneration equivalent to 10 percent of the net profits realised by the Paper Factory.

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The Managing Agents besides the above remuneration will be paid their actual office establishment employed for the purposes of the factory to the extent of Rs. 1,000 per month. The Managing Agents will not be entitled to any charges on account of the services of superior staff like their Managing Agent, Engineer-in-Chief, Directors or other Officials beyond the extent of the actual travelling and other expenses incurred by them during the discharge of their duties.

## 15. FINANCIAL.

The capital outlay needed for the factory has been worked by our Consulting Engineer in great detail and amounts to B. G Rs. 28,93,745. To this has to be added a sum of Rs. 50 lacs towards land acquisition and clearing of site, etc. Rs 30 lakhs towards preliminary expenses and Rs. 50 lakhs towards brokerage and commission to under-writers. Besides this a further sum of Rs. 6 lakhs will be needed as working Capital. The estimate of the total amount required thus will be:—

Bamboo preparing machinery	B. G. Rs.	11,89,277
Boiler Plant	....	4,50,000
Soda Recovery and Causticising Plant	....	2,37,800
Electrolytic Bleach and Caustic Plant	....	2,01,000
Power Plant	....	1,16,000
Rag Boiling Section	....	44,218
Sizing Plant	....	20,000
Building and Factory	....	2,71,050
Quarters for Staff	....	1,16,900
Mill Furnishing and Miscellaneous	....	2,47,500
Total B. G. Rs.	....	28,93,745
Add. 16-2/3% towards exchange	....	4,82,291
	O. S. Rs.	33,76,036
Land Acquisition and Clearing of site	....	50,000
Preliminary expenses	....	30,000
Brokerage and Commission to under-writers	....	50,000
TOTAL O. S. Rs.	....	35,06,036
Add. 10% for overhead and unforeseen	....	3,50,603
Working Capital	....	6,00,000
Rounding	....	43,361
GRAND TOTAL O. S. Rs.	....	45,00,000

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In comparison with the estimate of the Mysore Paper Factory, in particular, this estimate at the first glance, will appear rather high. But there is some difference between the Mysore Factory and this Paper Factory. The Mysore Factory has been designed for an output of 4,500 tons of Paper per annum while this factory is capable of an output of 6,000 tons. In the estimate of the Mysore Factory several auxiliaries are not included and it is believed that all these will have to be purchased over and above the estimate before the factory actually gets going. The present estimate has been prepared taking every little detail into account. And then, the Mysore Factory has been estimated on the quotations of Continental firms, while the estimate of this factory is based on the prices of best British manufactures.

There is a way of saving about Rs. 5 lakhs in the issued capital by borrowing the working capital from banks. But it will not appeal to popular feelings to make the factory dependent upon banks from the very outset. However, the matter deserves careful consideration and may be decided at a later stage.

The question of financing the scheme now comes up. A sum of forty-five lakhs is a fairly large amount and it would not be prudent to launch the scheme until at least Rs. 35 lakhs out of this sum is either subscribed or underwritten. According to the present proposal, the Hyderabad Construction Coy., Ltd., is prepared to subscribe Rs. 5 lakhs and the Directors and associates of the Hyderabad Construction Coy., Ltd., are prepared to subscribe or underwrite a further sum of Rs. 10 lakhs. Added to this Rs. 10 lakhs from Government the total capital subscribed or underwritten will amount to Rs. 25 lakhs. No difficulty is anticipated for the balance amount of Rs. 20 lakhs. The Hyderabad Construction Coy., Ltd., has at present offers from Bombay capitalists for large blocks of shares, but in pursuance of its rigid policy The Hyderabad Construction Coy., Ltd., would like to regard this as the last resort and has therefore not taken these offers into account. Nevertheless, it is not proposed to launch the scheme unless ten out of the remaining Rs. 20 lakhs are definitely subscribed or under-written before-hand. If preliminaries are settled by the Government at an early date then it is hoped that it would not take long for

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the Hyderabad Construction Coy., Ltd., to get the balance amount subscribed.

The Hyderabad Construction Coy., Ltd., have also considered the aspect when the Government may not choose to participate in the scheme financially. We believe that although this would make matters difficult, yet it will not make it impossible to get the scheme through. But in that event, the, Hyderabad Construction Coy., Ltd., will of course have to depend on its associates from outside the State.

It has been shown elsewhere in the note that the maximum price of manufactured paper delivered to market will not exceed B. G. Rs. 270 per ton. The lowest level that the prices of paper are likely to touch, after the protection is abolished, is Rs. 375 per ton. This leaves a clear margin of Rs 105 per ton. If the factory turns out 5,000 tons of paper a year it could easily realise Rs. 5.25 lakhs as net profit. Deducting Rs. 1,27,500 for reserve a dividend of 9% can always be easily paid. For the time the protection is on, the factory will make surplus profits and the extra profits can go on to build up a fair reserve.

**MIR LAIK ALI,**

Engineer-in-Chief & General Director,

**The Hyderabad Construction Coy , Ltd.**

# The Hyderabad Construction Coy., Ltd.

## APPENDIX-I.

### FORMATION OF HYDERABAD PULP AND PAPER COMPANY LIMITED.

1. It is proposed to form a limited liability Company, in the State of Hyderabad, situated at Sirpur for purposes of manufacture of pulp, paper and boards of all classes and any other articles manufactured from paper and to transact any business in connection with the sale and manufacture of paper and pulp and any other allied industry and to acquire forests, mines, licenses, leases and other rights needed in the interests of the industry and to erect mills, buildings, warehouses and to carry on the business of sales and purchases and to enter into any agreements or contracts with any other dealers or manufacturers and do any other business which may seem to the Company capable of being conveniently carried on, and calculated directly or indirectly to help or enhance the interests of the concern.

2. The name of the concern will be **The Hyderabad Pulp and Paper Company Limited.**

3. The **Company** will be registered in Hyderabad and conform with the Hyderabad Companies Act IV of 1320 F.

4. The Company will conduct its business under a license to be granted by **H. E. H. The Nizam's Government** for the manufacture of Pulp and Paper and for the exploitation of the Bamboo areas of Adilabad and Asifabad Districts in a manner that would not do any substantial harm to the future growth or expansion of bamboo in those areas for a period of 40 years in the first instance.

5. The Authorised Capital of the **Company** at its formation will be O. S. Rs. 50 lakhs of which Rs. 45 lakhs will be the issued capital and the Directors will have authority under the Articles of Association from time to time, to increase the capital to the extent of Rs. 2 crores.

6. The initial capital, to the extent of Rs. 10 lakhs, will be subscribed by **H. E. H. The Nizam's Government** and Rs. 5 lakhs by **the Hyderabad Construction Company Limited** and a further sum of Rs. 10 lakhs will be subscribed or underwritten by the Directors and Associates of **the Hyderabad Construction Co., Ltd.** The balance of

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Rs. 20 lakhs will be offered to the public and in the allotments of shares the residents of the Hyderabad State will be given the first preference. Shares will be allotted to non-residents of the Hyderabad State only in the event of any shares remaining unsubscribed by the people of the State.

7. The Management and Technical direction of the Company will be conducted by **the Hyderabad Construction Co., Ltd**, as Managing Agents under the supervision and control of a Board of Directors consisting of eight Directors, two of whom will be nominated by the **Government** one by **the Hyderabad Construction Company Limited**, and the remaining five elected from among other shareholders.

8. The Memorandum and Articles of Association will be drawn up with the object of empowering the **Company** to conduct the business of the manufacture of paper and pulp and any other allied products and also to expand the activities of the **Company** in other lines and industries which may be calculated to be directly or indirectly beneficial to the interests of the **Company**.

9. The **Company** will pay a Royalty of Rs. 3 per ton to **H. E. H. The Nizam's Government** for the entire air dry bamboo entering the premises of the **Company** extracted from any of the forests of **H. E. H. The Nizam's Government** and the minimum Royalty payable to the **Government** in any year will be Rs. 25,000.

# The Hyderabad Construction Coy., Ltd.

## APPENDIX II.

**Draft Agreement between His Exalted Highness the Nizam's Government and The Hyderabad Construction Company Limited, towards the grant of a License to the proposed Hyderabad Pulp and Paper Company Limited after its formation.**

This agreement made on the.....day of .. between **H. E. H. The Nizam's Government** (hereinafter called *the Government*) of the first part, and **The Hyderabad Construction Coy., Ltd.** (hereinafter referred to H. C. C. whose registered offices are at Musahib Jung's Buildings, Abid's Road, Hyderabad-Deccan) of the second part.

1. The H. C. C. in co-operation with the *Government* and in accordance with the Hyderabad Companies Act IV of 1320 F. will endeavour to procure the incorporation in Hyderabad State of a Company (hereinafter referred to as the "*Company*") with liability limited by shares and with the object of installation, maintenance, development and carrying on the business of manufacture and sale of paper and pulp and like products mostly from Bamboo extracted from the bamboo areas of the State Reserve Forests situated in the districts of Asifabad and Adilabad and the following provisions shall apply.—

(i) The name of the *Company* shall be **The Hyderabad Pulp and Paper Company Limited.**

(ii) The share capital of the *Company* shall be expressed in O. S. Rupees.

(iii) The Authorised Capital of the *Company* in the first instance will be O. S. Rs. 50 lakhs of which O. S. Rs. 45 lakhs will be offered for subscription and the Directors will have power under the Articles of Association to increase the Capital from time to time to the extent of Rs. 2 Crores.

(iv) Of the Issued Capital in the first instance the H. C. C. will subscribe Rs. 5 lakhs, the *Government* will subscribe Rs. 10 lakhs and the Directors and Associates of **The Hyderabad Construction Coy., Ltd.** will subscribe or underwrite a further sum of Rs. 10 lakhs.

(v) The face value of each shares will not exceed Rs. 100 nor will be less than Rs 10.

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(vi) In the allotment of shares first preference will be given to the residents of H. E. H. The Nizam's Dominions and Berar and in the event of any shares remaining unsubscribed for a period of one month after they are offered to the public the same will be allotted to the non-residents of the State.

(vii) The Articles of Association shall make full provision for the appointment of the H. C. C. as the Managing Agents of the *Company* and shall contain provisions to give full effect to the terms and conditions set out in Appendix IV.

(viii) The Articles of the Association of the *Company* shall provide that the Board of Directors will comprise of eight Directors of whom two will be nominated by *Government*, one will be nominated by the H. C. C. and the remaining five will be elected from among other shareholders of the *Company*.

(ix) The preliminary expenses for the formation of the *Company* shall be borne by the H. C. C. but shall be repaid to the H. C. C. by the *Company* after its formation.

2. The *Government* will, upon the incorporation of the *Company*, immediately grant to the *Company* the sole and exclusive lease of the bamboo areas situated in the Districts of Asifabad and Adilabad and will grant to the *Company* full rights to utilise free of any Royalty any materials like limestone, building materials water from surface or subsoil drainage and the rights to lay pipe lines contour channels or conduits, construction of anicuts, covered or uncovered infiltration drains or galleries or storage reservoirs and to instal or lay overheard telephone and electric lines, underground cables, trolley lines and construction of permanent or temporary roads in a manner that would not be prejudicial to the interests of the *Government* or be in any way harmful to the inhabitants of the surrounding areas.

3. The lease will be for a period of 40 years and during this period the *Government* will not give any similar rights to any other company for the manufacture of pulp or paper in these Districts and should the demand justify the installation of any other paper or pulp factory in any other part of the State then the *Company* will be given the first option to erect such a factory and in the event of the *Company*

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declining to do so or being unable to do so within a reasonable period of time, the *Government* will grant permission to any other person or persons to undertake such an enterprise.

4. Upon completion of this Agreement the H. C. C. may appoint expert or experts to further investigate the details and to prepare working details and to frame detail estimates for the construction of the factory and all such expenses together with the expenses already incurred by the H. C. C. shall in the first place be borne by the H. C. C. but shall be repaid to the H. C. C. by the *Company* after its formation.

5. If any question of dispute or difference arises between the parties hereto touching the meaning, construction or effect of this agreement or the rights or duties or liabilities of any party hereunder or the form or contents of the Memorandum and Articles of Association of the *Company* or of any such agreement or license aforesaid or otherwise howsoever arising out of this agreement the same shall be referred to the determination of two Arbitrators, one to be appointed by the *Government* and one by the H. C. C. or if such Arbitrators shall fail to agree within 30 days then to an Umpire who shall be appointed jointly by the two Arbitrators and the decision of such Arbitrators or Umpire shall be final and binding on the two contracting parties

Seal of the Government of  
His Exalted Highness the Nizam of  
Hyderabad was affixed hereunto in  
the presence of :-.....  
.....

Seal of the Hyderabad  
Construction Company Limited  
was affixed hereunto in the  
presence of :-.....  
.....

CHAIRMAN,

Managing Agent.



# The Hyderabad Construction Coy., Ltd.

## APPENDIX III.

**Draft License and Lease to be granted by His Exalted Highness the Nizam's Government to The Hyderabad Pulp and Paper Company Limited. and the Conditions of License and Lease.**

By virtue of these Presents **The Government of His Exalted Highness The Nizam's** is pleased to grant to **The Hyderabad Pulp and Paper Coy., Ltd.** the sole and exclusive right to establish, maintain and operate a factory for manufacture of Paper and Pulp and allied products therefrom in the Districts of Asifabad and Adilabad together with a lease of the bamboo areas in the two Districts for a period of 40 years from the date of this License and the following provisions shall apply :—

**The Hyderabad Pulp and Paper Company Limited.** (hereinafter called the *Company*) will have the sole and exclusive rights for manufacture of Paper and Pulp chiefly from bamboo extracted from the bamboo areas situated in the Districts of Asifabad and Adilabad with rights to import bamboo from any adjoining areas outside the State in the event of the bamboo areas within an economical radius of the factory getting flowered and for the mining and quarrying of limestone or any other chemicals needed by the *Company* for the manufacture of paper or building constructions free of any Royalty.

2. During the period of License the *Company* will have the sole right of exploiting the bamboo areas in the Districts of Asifabad and Adilabad and will make use of this bamboo for the purposes of pulp and paper manufacture and if any bamboo is required for any other purposes other than manufacture of pulp and paper the *Company* will cater all the local demands at rates not exceeding those fixed by the *Government* in Revenue Department as a maximum.

3. During the period this License and the Lease of the bamboo areas of Asifabad and Adilabad the *Government* will not permit any other concern to set up any factory or factories for the purpose of manufacture of Pulp and Paper or any allied products thereof in any or both of the above named districts and further at any time should the demand justify the establishment of any other factory for manufacture of Paper or Pulp in any other parts of the Dominions

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during the period of this License the *Government* will give to the *Company* first option to erect such a factory and should the *Company* decline to do so or fail to take advantage of the offer within a reasonable period the *Government* will have the right to permit any other person or persons to erect such a factory in any part of the Dominions other than the Districts of Asifabad and Adilabad.

4. The *Company* will have full rights in connection with the manufacture of Pulp and Paper to exploit the bamboo areas in the Districts of Asifabad and Adilabad in a manner that will not be harmful to further growth or expansion of bamboo.

5. The *Company* will have the right in connection with the business of paper and pulp manufacture to tap surface and subsoil sources of water supply at any place within a convenient radius of the factory and to construct anicuts or storage reservoirs on any stream or streams in the vicinity of the factory and to construct channels or conduits open or covered from such reservoirs to the site of the factory and to construct infiltration drains or galleries covered or uncovered to tap the subsoil or surface drainage of the surrounding areas and to lay channels or pipe lines therefrom to the site of the factory and to lay overhead electric or telephone lines or lay underground cables and to construct trolley lines and operate light railways on it for the conveyance of the materials needed by the factory and to construct roads, cart tracks, buildings and huts to instal machinery and plant of any description driven by electric or steam or water or diesel powers at any place in the vicinity of the factory which is considered necessary for the working of the *Company*.

6. In the first place this License to manufacture Pulp and Paper and the lease to exploit the bamboo areas in the districts of Asifabad and Adilabad is granted for a period of 40 years from the date of License and thereafter it will be renewable for further periods of 20 years at the option of the *Government*.

7. **His Exalted Highness the Nizam's Government** will have the right to determine this License and Lease in the event of the *Company* going into liquidation otherwise than for the purpose of reconstruction or amalgamation or in the event of the factory remaining out of action for a period of 3 years or in the event of the

## THE HYDERABAD CONSTRUCTION COY., LTD.

*Company* failing to pay its dues to the *Government* for a successive period of 3 years.

8. The *Company* will pay to **H. E. H. the Nizam's Government** a Royalty of Rs. 3 per ton on air dry bamboo brought within the premises of the factory and the term air dry bamboo will include bomboos containing moisture not exceeding 10 percent of their weight and in the case of green bamboos the moisture contents will be considered as 25% of the weight of the bamboo and in that event the *Company* will get a discount of 15% by weight towards payment of Royalty and further the *Company* will be bound to pay a minimum of Rs 25000 towards Royalty to the *Government* whether bamboo to that extent has been extracted by the *Company* for its requirements or not.

9. In the event of the surrounding areas within an economical radius of the factory getting flowered and the *Company* being obliged to import bamboo from outside the State the *Government* will give to the *Company* a rebate of 50 percent of the minimum Royalty guaranteed to the *Government* for such period as the *Company* has to import its bamboo from outside the State for the above reasons.

10. In the event of any dispute or difference arising as regards interpretation or application of any of the aforesaid clauses the matter will be referred to the determination of two Arbitrators one to be appointed by **H. E. H. the Nizam's Government** and one by the *Company* and if such Arbitrators fail to agree within 30 days then to an Umpire to be appointed by the two Arbitrators and the decision of such Arbitrators or Umpire shall be final and binding on **H. E. H. the Nizam's Government** and the *Company*.

And in the above clauses the expressing "*Government*" or **H. E. H. The Nizam's Government** means the Government of **His Exalted Highness The Nizam of Hyderabad** and the expression "*Company*" means **The Hyderabad Pulp and Paper Coy., Ltd.**, incorporated under the Hyderabad Companies Act or their successors or assigns.

Seal of **H. E. H. the Nizam's Government**  
was hereunto affixed in the presence of :—

.....  
.....



# The Hyderabad Construction Coy., Ltd.

## APPENDIX IV.

**Conditions of Appointment of the Hyderabad Construction Company Limited. as Managing Agents of Hyderabad Pulp and Paper Company Limited.**

*Articles of Agreement* made and entered into this..... ..  
.....day of.....between  
**His Exalted Highness the Nizam's Government** (hereinafter referred to as the "*Government*") of the first part and **The Hyderabad Construction Company Limited.** a Joint Stock Company registered under Hyderabad Companies Act 4 of 1320 F. with its Registered Office in Hyderabad Deccan, (hereinafter referred to as the "*H. C. C.*") which expression wherever the context so admits includes its successors and assigns of the second part, Whereas it is agreed as follows :—

1. **The Hyderabad Construction Coy., Ltd.** by virtue of their being responsible for the incorporation of **The Hyderabad Pulp and Paper Coy., Ltd.** (hereinafter referred to as "*Company*") will be appointed as Managing Agents of the said *Company* from the date of registration of the *Company* for such time as the *Company* be in existence or until the H. C. C. shall resign after giving one year's notice of their intention to do so and the Articles of Association of the *Company* shall contain provisions and give effect to all the terms set out in this agreement.

2. The appointment of H. C. C. as Managing Agents of the *Company* is not liable to be revoked or cancelled nor shall they be removed from the office except if found guilty of fraud.

3. Subject to the control of the Directors the H. C. C. as such agents shall be responsible for the general conduct and management of the business and affairs of the *Company*, and they shall have and exercise all such powers, authorities and discretions as are given to or vested in them by the Articles of Association of the *Company* or as may from time to time be delegated or entrusted to them by the Directors and in particular but without prejudice to the generality of the foregoing provisions and without in any way restricting or limiting the general power and authority to be conferred on the H. C. C., the H. C. C. as such agents shall on behalf of the *Company* have and exercise the following powers that is to say :—

## THE HYDERABAD CONSTRUCTION COY., LTD.

(a) To negotiate and enter into contracts for the acquisition by purchase, lease or otherwise of movables and immovable property and any options relating to the same and any rights, privileges and concessions which may be requisite or desirable for the purposes and business of the *Company*

(b) To purchase and pay for any machinery, plant, stores, apparatus and other articles and things required for the company and to erect or cause to be erected any buildings or plants of any description.

(c) To instal, maintain, repair, and operate any machinery directly or indirectly needed in the Pulp and Paper Industry and to enter into all necessary and proper contracts with suppliers, consumers and others.

(d) To execute, become parties to and wherever necessary to cause to be registered all deeds, agreements, contracts, receipts, and other documents on behalf of the *Company*.

(e) To insure the property of the *Company* for such purposes and to such extent as they may think proper

(f) To institute, conduct, defend, compromise, refer to arbitration and abandon legal and other proceedings, claims and disputes in which the *Company* is concerned.

(g) To appoint, employ, discharge, re-employ or replace solicitors, bankers, engineers, chemists, experts, managers, secretaries, officers, agents, brokers, clerks, mechanics, workmen and other servants and employees with such powers and duties and upon such terms as to duration of employment, remuneration or otherwise as they think fit. In the exercise of these powers, the H. C. C. shall to the best of their ability employ and train subjects of H. E. H. The Nizam.

(h) To sign cheques and operate on the banking account of the *Company* and to draw, make endorse, negotiate and sell bills of exchange promissory notes and other negotiable instrument with or without security and to borrow monies and obtain advances (with or without securities) and to sign receipts for moneys, good and property received on behalf of the *Company* and to give effectual discharges for the same.

## THE HYDERABAD CONSTRUCTION COY., LTD.

4. The H. C. C. as such agents shall faithfully and diligently and to the best of their ability and power, transact, do, perform and superintend all such matters and things relating to the business and affairs of the *Company* or for carrying out its objects as may be vested in them as such agents under the Articles of Association of the *Company*.

5. The H. C. C. as such agents out of the moneys of the *Company* which shall come to their hands shall make all necessary and proper disbursements for the purpose of carrying on the business of the *Company* and shall cause true accounts which should be subject to an independent audit to be kept of the paid-up capital for the time being of the *Company* and all sums of money received or expended by or on behalf of the *Company* and of the matters in respect of which such receipts or expenditure takes place and of the credits and liabilities of the *Company* and generally of all its commercial, financial and other affairs, transactions and engagements, and all other matters necessary for showing its true financial state and condition.

6. The H. C. C. as such agents shall from time to time prepare or cause to be prepared a Profit and Loss Account and Balance Sheet to be laid together with a report from an independent auditor before the *Company* in a General Meeting, and all returns, statements and summaries required to be filed and shall file or cause to be filed the same.

7. The *Company* shall pay all expenses incurred in the management of the business of the *Company* and also all expenses of maintaining suitable offices, show rooms, repair shops and the like needed in conducting the business and the H. C. C. as such agents shall be at liberty to reimburse and pay out of the monies of the *Company* all the costs and expenses of providing and maintaining the offices, staff and establishment of the *Company*, the salaries and wages of Engineers, technicians, clerks, accountants, auditors, servants, employees and workmen employed on behalf of the *Company* and all other monies expended for and on behalf of the *Company*.

8. The H. C. C. as such agents will be paid all the expenses incurred by them in the discharge of their duties and will receive a sum not exceeding Rs. 1000/- a month to cover their actual expendi-

## THE HYDERABAD CONSTRUCTION COY., LTD.

ture for maintaining an office establishment to deal effectively with all the business pertaining to the *Company*; but any charges due to salaries or commission of the Engineer-in-Chief, Managing Agents, or the the Directors of the H. C. C. will not be debited to the *Company* beyond actual travelling or incidental expenses incurred by them during the discharge of their duties for the *Company*.

9. The *Company* in addition to all such charges that have been enumerated in clauses 7 and 8 will also pay to the H. C. C. a sum amounting to 10 per cent of the profits received by the *Company* at the close of each financial year towards their Managing Agency fees and the expression profits will be the difference between the gross receipts of the *Company* and the working expenses, depreciation fund, insurance fee, reserve for bad debts but not any reserve or sinking fund and the Managing Agency fee will cover all charges borne by the H. C. C. on their higher staff or Directors engaged in the work of the *Company* and any other charges that the H. C. C. might have to incur by way of fees to consultants or advisors provided such fees do not amount to more than Rs. 1000/ per month.

10. The H. C. C. as such agents shall have charge and custody of the property, books of account, papers, documents and all effects belonging to the *Company* wherever the same may be.

11. In the event of the *Company* being wound up at any time for the purpose and with the object of transferring its business to another Company, the *Company* shall make it one of the terms and stipulations of its agreement for the transfer of its property and business to such other Company aforesaid, that such other Company shall appoint the H. C. C. to be the Agent of such new Company and with the like powers and authorities and on the same terms and conditions as to remuneration emoluments and otherwise as enjoyed by the H. C. C. theretofore.

12. The H. C. C. shall be indemnified by the *Company* against and it shall be the duty of the Directors out of the funds of the *Company* to pay all costs, losses and expenses which the H. C. C. may incur or become liable to by reason of any contract entered into or act or deed done by them as such agents or in any way in the discharge of their duties including travelling expenses. The H. C. C.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

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shall not be liable to the *Company* for any losses occasioned by acts done in the discharge of their duties.

13. Subject to the approval of **H. E. H The Nizam's Government** the H. C. C. shall have power to transfer, assign or lease out their Managing Agency Rights of the *Company*.

Seal of the Gvernment of  
His Exalted Highness the Nizam of  
Hyderabad was affixed hereunto in  
the presence of :-.....  
.....

Seal of the Hyderabad  
Construction Company Limited  
was affixed hereunto in the  
presence of :-.....  
.....



# The Hyderabad Construction Coy., Ltd.

## APPENDIX V.

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**NOTE**  
**AND**  
**SPECIFICATION & ESTIMATES**  
**FOR**  
**5000–6000 tons Paper Mill At Sirpur**  
**BY**  
**MR. W. J. ALCOCK,**  
**M. I. C. E., A. M. I. M. E., ETC., ETC.**

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# The Hyderabad Construction Coy., Ltd.

*From*

**W. J. ALCOCK,**

MEMBER INSTITUTION CHEMICAL ENGINEERS.  
ASSOCIATE INSTITUTION MECHANICAL ENGINEERS.  
FELLOW INSTITUTION OF FUEL

**Consulting Engineer,**

**7.- Hastings Street,**

**CALCUTTA.**

*25th September 1936.*

REF : PAP/H-C.

*To*

**Messrs. The Hyderabad Construction Co. Ltd.,**

**ABIDS' ROAD,**

**HYDERABAD DECCAN.**

## **PROPOSED BAMBOO PULP AND PAPER MILL, "SIRPUR"**

DEAR SIRs,

Acting on your instructions I left Calcutta for Sirpur and Hyderabad, by the Bombay Mail on the evening of the 14th September, reaching Sirpur on the evening of the 15th September staying at the "Rest House" for the night, early next morning I was joined by Mr. Laik Ali, who had arranged that we should inspect the Bamboo in the Garlapett Block, possible Mill Site and investigate the question of Water Supply for the proposed Paper Mill

As you had furnished me with a copy of "A Report on Prospects of Paper Manufacture" Bulletin No 4 (new series) I had taken the opportunity of making myself familiar with the data it contained especially respecting the quality and possible supply of Bamboo in the "Sirpur" area. The time at my disposal was too limited to proceed to the limits of the Garlapett Block, so I had to content myself with a general survey but I am of the opinion from the area covered by Mr. Laik Ali, and myself that the statements covering the bamboo in this Block are fair and reasonable, coupled with Kadamba Block there is ample future supplies of bamboo to serve a Pulp Mill considerably larger than the one projected.

## THE HYDERABAD CONSTRUCTION COY., LTD.

For my own observation I had several culms or stems cut by a forest man without choice, the culm cut easily with a light axe, one minute only was taken for cutting and extracting the stem from the clump, the stems from several clumps averaged 35-40 feet long, girth 4"-5" (samples are with you) asked the age of the stems cut the forest man indicated that this was their 3rd monsoon.

What pleased me was the clean and easy way the stems cut and chipped, so much so that in my specification for Plant and Machinery, I have budgeted for Chipping Plant in preference to Crushers.

Agreeing that the bamboo is there both in quality (which I deal with later) and quantity, we went into the ways and means of extraction and delivery to the mill situated say by the Sirpur Railway Station.

Page 18 of the Bulletin gives for :—

Kadamba Block, cost of felling and extraction Rs. 3-0-5 per ton bamboo.

Garlapett Block, cost of felling and extraction Rs. 3-8-3 per ton bamboo.

We however consider that Rs. 4 would be a fair charge for felling and extraction.

Transport to the mill required consideration, whilst for the first year or so of the Mill's operation. Bullock carts might handle the tonnage, in my experience 5 mile out and 5 mile home by rough track is about as much a carter cares for, he likes to get his bullocks home for their evening fodder.

The Bulletin suggests a pucca road or Light Railway, we consider that a light railway is essential, using bullock carts as feeders to same, so at no time should there be any necessity for the bullocks to haul a loaded cart more than 5 miles.

On this basis I have worked out the following proposal which include a light railway, locomotives and rolling stock, the cost of which for 10 miles of track would be slightly under one lac of rupees.

# THE HYDERABAD CONSTRUCTION COY., LTD.

Estimate for the supply of bamboo to a mill at Sirpur is as follow :—

## **2½ tons of Bamboo per ton of Paper**

Royalty at Rs. 3 per ton for 2½ tons of Air Dry Bamboo	....	....	....	Rs. 8 4 0
Felling and loading bamboo 2½ tons at Rs. 4 per ton	....	....	....	„ 11 0 0
Carting bamboo from surrounding areas to rail head at Rs. 2 per ton ..	....	....	....	„ 5 8 0
Conveying bamboo by light railway to mill in- cluding loading and unloading at Rs. 2 per ton....				„ 5 8 0
			Total ....	„ 30 4 0
Add 20% towards supervision incidental and un- forseen ....	....	....	....	„ 6 0 10
			O. S. „	36 4 10
		or	B. G. „	31 2 0

*i. e.*, B. G. Rs. 11-5-0 per ton,

**or say Rs. 12-0-0 per ton.**

Bulletin No. 4 map showing bamboo areas, possible site for a mill has been shown on the fringe of the Garlapett Block, near the Sirpur Railway Station, the site appears suitable. By clearing back the forest say for half a mile would keep the site healthy for the staff and workers, the railway cutting shows a red earth overlying moram and disintegrated rock, I do not anticipate there would be any difficulty as regards the foundations, there is also a good drainage away from the suggested site.

**Buildings :—**We considered it opportune to discuss this when at Sirpur, Mr. Laik Ali was of the opinion that stone masonry would be the best to which I concur, roofs of the Mill Buildings generally would be Steel Trusses, covered with Corrugated Asbestos Sheets.

## THE HYDERABAD CONSTRUCTION COY., LTD.

**Water Supply :—**My visit to Sirpur being limited in time and my want of local knowledge concerning the rainfall, strata, adjacent river, does not permit me to give a considered proposal, I therefore have to rely on what data there is on the subject in Bulletin No. 4, together with the information Mr. Laik Ali, furnished me, and a discussion we had later with Mr. Arifuddin in Hyderabad. There would appear that a water supply for the Mill say 1,500,000 gallons daily (24 Hours) would be available, however this I feel sure will be given the fullest investigation.

Bulletin No. 4, Pages 32&33 gives information of two sources of Limestone which may be converted into Quicklime. Analysis of a deposit at Ramagundan Station showed : -

CaCo <sub>3</sub>	....	....	....	86.33%
SiO <sub>2</sub>	....	....	....	7.40%
Fe <sub>2</sub> O <sub>3</sub> . Al <sub>2</sub> O <sub>3</sub>	....	....	....	5.37%

The quality may be considered fair and I would advise that the Limestone should be burned by **wood charcoal** to keep down the ash in the CaO.

**Coal Supplied :—**Sirpur being situated about midway between the Bellaharashah Colliery and the Colliery at Bellampalli, the Mill will be able to draw its supplies from either of these at competitive rates.

We visited the Belampalli Colliery, for the purpose of gaining first hand knowledge of the coal mined and how it was prepared for the market, we were fortunate in being able to both inspect the mine headworks which are of the most modern type for sorting coal into various grades, and the Manager Mr. Berry and Mr. Guthrie, Chief Engineer, gave us valuable information on the burning of the coal mined at Bellampalli.

“ Bellampalli Round Coal ” and “ Screened Coal ” are sold out for a considerable time to come and they advised us to budget for their Round Coal and put in a Crusher for crushing same down to a size suitable for use on Mechanical Stokers, Mr. Guthrie advised that the power required would be very little.

## THE HYDERABAD CONSTRUCTION COY., LTD.

I am therefore assuming that the Mill at Sirpur can be supplied with coal having a calorific value of 10,500 to 11,000 B. T. U. S. per pound, with an ash content 18-20% and have in my specification covered for this.

Mr. Berry was not able to give us any information as to price, but on the 19th September, a visit was received from the Representative of the Singareni Company, who promised he would endeavour to name a price by the 23rd September. (I have now received your telegram reading :—

“Coal Ex-Sirpur Rupees Five Annas Two per ton”

A very satisfactory figure about rupees two below the price at which the Mills on the Hooghly are securing their supplies of coal.

**China Clay:**—Indian Clay won in the Chota Nagpur Districts is being used in the Indian Paper Mills, it costs them round Rs. 35 per ton delivered; for the longer rail freight I have allowed Rs 50 per ton delivered Sirpur.

**Alumina Sulphate:**—is being made in the Calcutta District from Bauxite mined at Katni, and is used in the Paper Mills on the Hooghly, to allow for the longer freight I have taken the cost to be Rs. 100 per ton Sirpur.

**Sundry Chemicals:**—Usually Rs. 5 covers this but I have allowed Rs. 10 per ton of paper made.

**Salt:**—For the production of Caustic and Bleaching Liquor by the Electrolytic Process is available (Indian) at either Madras or Bombay, duty free round Rs. 15 per ton, I have allowed this to be Rs. 35 per ton of salt delivered Sirpur.

In the Manufacture of Book and Ledger Papers a certain amount of rag is added to the furnish, these may be gathered in Hyderabad and District, though the rags cost more than Bamboo, their Cellulose contents are much higher and cost of treatment less so for the purpose of the estimate it is not necessary to include.

The above covers the raw materials.

**Mill Labour:**—Bulletin No. 4 is hopeful about the supply of unskilled workers but it will be necessary to import from other Dis-

## THE HYDERABAD CONSTRUCTION COY., LTD.

tricts, Digestor, Bleaching, Beator Machine and finishing House Workers. In the list of Labour already handed to Mr. Laik Ali, I have allowed for this, I have suggested to Mr. Khaja Nizamuddin, Paper Expert, that his service and Plant might be helpful in training youths of good education who after serving as apprentices in the Mill for a time could be appointed Supervisors.

**Staff:**—The General Manager should have a thorough knowledge of the Manufacture of Paper, etc.

Assistant Managers must be practical men of the Home Superior foreman type and I would advise that after careful selection they be brought out on a 3 or 4 years agreement. Chief Engineer should be a Home man with a first class Technical Training and experience in up to date Paper Mills.

Shift Engineers, Chief and Assistant Chemists, it should be possible to secure locally.

**Method of Manufacture** :—Bulletin No. 4 Page 32, mentions the Sulphate process will be employed, I agree that by the use of the Sulphate or more strictly speaking Sulphide Process certain advantages are gained *i. e.*, somewhat easier bleaching with possible 2-3% higher pulp yield. Providing like the Swedish, United States and Canada Mills, the Mill is near a cheap supply of sulphate of Soda and Bleaching Powder this process holds good, but a Mill in India, especially at Sirpur which is several hundred miles inland, the process does not hold. The chief factor however is that in the event of international complications as soon as the Mill's stock of Sulphate of Soda and Bleaching Powder (which are not made in India) are exhausted the Mill would have to shut down. Coupled with this it would cost Rs. 23 per ton more than if the Mill made its own Caustic Soda and Bleaching Liquor from Indian Salt and Indian Coal

I consider if the Mill makes the **best use of these chief raw material i. e.** Bamboo Rs. 12 per ton, Coal Rupees 5-4-0 per ton, Salt Rs. 35 per ton it will stand unrivalled.

To enable this to be accomplished I have projected a Mill which can be worked with the best economy as regards materials and labour.

## THE HYDERABAD CONSTRUCTION COY., LTD.

From the time the Bamboo is fed into the Chippers, the pulp is not man handled till it is laid on the finishing tables by the overhead electrically driven Transporter, this has been accomplished without undue capital expenditure.

**Boiler Plant:**—For the Generation of Steam for Paper and Process is designed to work at 300 lb. per square inch, pressure with a superheat of 250 F. I anticipate a thermal efficiency of 80%

**Power Plant:**—For the Generation of Power includes a 1750 Kw. Turbo Generator Set of the Extraction type from which steam can be drawn for extraction purposes, this Plant will supply Mill Power, Power for the Electrolytic and Soda Recovery Plant, Water and Lighting Supplied.

**The Digestors:**—projected are the largest that can pass over the Indian Railways, as regards diameter and will be Electrolytically welded, rivetting is not satisfactory for Soda Digestion work.

**A Rag and Broke Section:**—has been included following on standard practice.

**Beating:**—I have put forward the Hollander Type of Beator with heavy rolls, I know no better, though there are many patent types on the market.

### **Paper Machine and Callenders:—**

For a Mill to have an output of 5,000-6,000 tons of Paper yearly of the generally light class demanded by the Indian Market nothing less than a Machine with a width of wire 130" with a finished trim of 120" could be installed, my specification allows for this, also a Super Callender for giving a high finish.

**White and Sweet Water** A sum has been allowed to deal with these which is necessary for the economy of water, China clay and pulp.

In a final layout certain modifications may be necessary but they would be minor ones and for the purpose of the estimate need not be taken into account.

Having now deal with Raw Materials, Labour and Plant, I give below my estimate of cost of Manufacturing **One Ton of Finished Paper.**

# THE HYDERABAD CONSTRUCTION COY., LTD.

Bamboo 2½ Tons	@	Rs. 12/- per ton	....	Rs.	32	0	0
Coal 4½ Tons	@	„ 5/- per ton	....	„	23	10	0
Salt 4 Cwts.	@	„ 35/- per ton	....	„	7	0	0
Lime 10 cwts.	@	„ 15/- per ton	....	„	7	8	0
Alumina Sulphate 1 cwt.	@	„ 5/- per cwt	....	„	5	0	0
China Clay 3 cwts.	@	„ 50/- per ton	....	„	7	8	0
Sundry Chemicals	....	....	....	„	10	0	0
Cost of Raw Materials per ton of paper			....	„	92	10	0
Mill Labour including repair labour	....		....	„	33	6	0
Supervision	....		....	„	15	0	0
Mill Furnishing and Repairs.	....		....	„	30	0	0
Stores and Lubricating Oil	....		....	„	10	0	0
Overhead and Head Office Expenses	....		....	„	20	0	0
Average Railway Freight to Market	....		....	„	25	0	0
Depreciation 7½% on Rs. 28 lacs of rupees							
1½% on Rs. 3,88,000	....		....	„	42	13	0
Cost of One Ton of Paper			....	Rs.	268	13	0

Or 1·92 annas or say 2·00 annas per One Pound of Paper

A mill producing an all white finished paper round annas two per pound will be in a strong position and will be able to meet all internal and external competition. Further I am of the opinion that the Mill will be able to place its products in the Burmah and Strait Settlements and Ceylon Markets, with prospect of success.

As regards the future consumption of Paper, the following extract taken from "The Times Trade and Engineering" September 1936:—

"In Europe, particularly, the consumption of Paper in increasing enormously. Scarcely a week passes without news of some new plan to erect plant for the manufacture of additional pulp and paper. The demand for pulp in the last year or two has been so great that **available supplies of nearly every grade have been completely exhausted**".

I do not think you need have any hesitation in going on with the scheme.

Having included all the essential matters in this report and given erected costs of the Machinery, Plant and Buildings in my specification I conclude.

Yours faithfully,

W. J. ALCOCK.

# The Hyderabad Construction Coy., Ltd.

*From*

**W. J. ALCOCK,**

MEMBER INSTITUTION CHEMICAL ENGINEERS.

ASSOCIATE INSTITUTION MECHANICAL ENGINEERS.

FELLOW INSTITUTION OF FUEL

**Consulting Engineer,**

**7.- Hastings Street,**

**CALCUTTA.**

## **Manufacture of Paper from Bamboo Capacity 5,000--6,000 tons yearly.**

### **PLANT AND MACHINERY Section. I.**

#### **Description.**

#### **Cost Erected.**

#### **BAMBOO PREPARING MACHINERY:—**

One Slab Chipper of the Disc Type with heavy shaft and knives of cast steel, heavy bronze bearings, fast and loose pulleys, belt striking gear.

One spare set of knives.

One Shaker Type Screen of the Double Deck Type, complete with shaking gear fast and loose pulleys, belt striking gear, screens.

One Disintegrator, casing of heavy cast iron construction and split to facilitate inspection of rotor, with loose flails and adjustable stator teeth, the rotor to be made into a shaft which a cast steel body is to be securely keyed, extending from the centre of the body, there will be discs which will carry a number of rods lying parallel with the shaft to run in heavy type ball bearings.

Fast and loose pulleys, belt striking gear.

One spare set of flails.

One Elevator for chips to shaker chip screens, M. S. casing, boot with adjustable bearing, roller chain,

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

M. S. buckets, top gearing with fast and loose pulleys, belt striking gear.

One Conveyor for Chips from Disintegrator to chip Elevator including travelling belt, gearing and drive.

One fan and Feeding Apparatus for blowing Bamboo Chips to a cyclone to be placed over chip bins, possible height of bins above floor level 60'-0" fan to be arranged with necessary piping and connections.

PRICE Rs. 54,000

Storage Bins for Bamboo Chips three each having the capacity of one Digestor charge, to be made of M. S. plates and angles constructed on the spot.

PRICE Rs. 6,000

Power for driving this section I estimate 185 B. H. P. will be required but the final decision will rest on the Makers of the above Plant, (allowed) 185 B. H. P. Motor and Starter.

PRICE Rs 4,000

## **SPECIFICATION FOR DIGESTORS:—**

Three M. S. Digestors, bodies electrically welded and for a working pressure of 130 lbs. per square inch.

Digestors to be made under an approved British Insurance Co., Ltd., supervision who will issue the necessary certificates of manufacture and hydraulic test, bodies 9'-0" internal diameter x 25'-0" high, each digester to have a conical bottom and dished top with filling door 36" diameter, with cover and swing davit with raising and lowering screw. Inside the top of each Digestor is to be arranged a perforated screen for distributing the liquor and wash water.

On the top of each Digestor there is to be fitted a cast steel manifold having the following connections.

## THE HYDERABAD CONSTRUCTION COY., LTD.

Pressure Gauge.

Safety Valve.

Steam blow off.

Liquor Inlet.

Water Inlet.

Circulating liquor.

Cast Steel Outlet Block at bottom which will carry besides the main outlet valve 12" bore (valves to have monel metal fittings) steam inlet 4" bore.

Circulating liquor connection 4" bore.

The main outlet valve to be fitted with hollow spindle working through a packing gland in a chamber through which liquor or water may be forced to wash out the pulp.

One cast steel outlet to be fitted near the bottom of the cone 6" bore for special blowing off of the liquor or if necessary the wash water.

In the conical part of each Digestor will be fitted perforated steel plates.

Cast steel supporting feet and columns for carrying each Digestor.

PRICE Rs. 1,00,000

Three Centrifugal Open Impellor Type Centrifugal Pumps casing of the split type and of cast iron, cast steel impellor, monel metal pump shaft, ball or roller bearings to pump, pump suction 4" bore delivery 3" bore, each pump coupled through a flexible coupling to a 8-10 B. H. P. Motor 400/440 Volts, 3 phase, 50 cycles, squirrel cage type with auto starter, combined C.I. base plate. PRICE Rs. 5,000

One Steam Driven Duplex Type Force Pump designed for a steam pressure of 250 lbs. per square inch water pressure 175 lbs. per square inch, size steam cylinders 10" bore, pump cylinders 7"

## THE HYDERABAD CONSTRUCTION COY., LTD.

bore, stroke 10" bore, pump end gunmetal fitted,  
pump piston rings of gunmetal

PRICE Rs. 3,000.

### **PUMPS FOR WORKING THE DIGESTORS.**

Two Centrifugal Pumps of the Open Impellor Type, casings of the split type of cast iron cast steel impellers, monel metal pump rods, ball or roller bearings to pump, pump section 4" delivery 3" bore, each coupled through a flexible coupling to a 8-10 B. H. P. Motor, 400/440 volts, 3 phase, 50 cycles, squirrel cage type, auto starter with ammeter, combined C. I. Bedplate.

PRICE Rs. 3,200.

### **THREE STORAGE TANKS.**

One for wash liquor.

One for Strong liquor.

One for Hot Water.

May be second hand Lancashire Boiler Shells.

PRICE Rs. 5,000.

Six Pulp Washing Tanks constructed in site of reinforced concrete each tank to be 16'-0" diameter x 7'-6" deep, over the bottom on a steel framework will be fixed at 25 degrees a M. S. perforated grating, in the centre of the bottom of the tank there will be a 12" bore outlet with monel metal fitted sluice valve, for outlet of pulp.

There will also be fitted in the bottom :—

One 4" bore liquor outlet with sluice value,  
monel metal fitted

One ditto for wash water, with sluice value, monel fitted.

Near the top of each Tank will be :—

One 6" bore outlet with valve for strong liquor.

One 6" bore outlet with valve for waste water. PRICE Rs. 17,000

## THE HYDERABAD CONSTRUCTION COY., LTD.

One Centrifugal Pump and direct coupled motor for pumping digested pulp from the washers to Stuff Chests and capable of handling pulp up to 6% consistancy.

Pump to be of the Split Casing and End Suction Type, shaft of tough axle Steel.

Impellor to be of high grade phosphor bronze sleeves of phosphor bronze, ball bearings, etc., suction 12" bore, discharge 8" bore, to be direct coupled through a Flexible Coupling to a drip Proof Squirrel Type Cage Motor capable of developing 25 B. H. P. current 400/440 volts, 3 phase 50 cycles.

Roller or Ball Bearings.

Trifurcating Box to be provided.

Starters totally enclosed oil Immersed Floor Mounting Auto-Transformer Starter fitted for three overloads, time lags, one no-volt release, moving iron ammeter, etc., combined C I. bed plate. PRICE Rs. 4,680.

Two Storage Tanks or Chests for Strong Pulp from Washing Tanks to be constructed of reinforced concrete each 16'-0" diameter x 7'-0" deep, to be fitted with an improved type of mixer, one 12" bore outlet to each. PRICE Rs. 6,000.

One 20 B. H. P. Squirrel Cage Type Motor 400/440 volts, 3 phase, 50 cycles, ball bearing fitted speed and size of pulley to be decided later, one totally enclosed Oil Immersed Floor Mounting Auto-Transformer Starter, fitted for one no-volt and two overload Releases with time lags, iron ammeter, bedplate and rails for Motor. PRICE Rs. 1,100.

One centrifugal Pump and direct coupled Motor through flexible coupling for pumping pulp into the Breakers, Motor 25 B. H. P.

## THE HYDERABAD CONSTRUCTION COY., LTD.

Note:- This Pump and Motor may be a duplicate of the Pump for handling pulp from wash tanks. PRICE Rs. 4,580

Three breakers for breaking and washing pulp.

Bodies of reinforced concrete constructed in situ.

Size of Breaker 19'-0" long  $\times$  9'-0" wide, approximately 2'-6" deep at shallow end and 3'-0" deep at end, backfall and mid wall.

Recess for washing water 4'-9" long  $\times$  7½" wide, 5" deep and covered with a brass plate holes 1/16" diameter, 4" bore supply pipe for water.

Cast Iron Roll 4'-6" diameter  $\times$  4'-6" wide. securely fitted to a forged steel shaft running in roller bearings, parallel roll lifting gear.

The roll and bedplate to be fitted either with crucible steel bars, or phosphor bronze as the case may be.

There is to be one spare bedplate for each Breaker.

And one set of spare knives.

Roll covers of cast iron sides wood lagging with usual front and tail boards.

Doctor above the backfall and behind the roll.

String catchers to be fitted.

Drive for Breakers will comprise the Texrope.

System : Pulley on Breakers Shaft 96½" diameter grooved for 7'-1¼" Texropes.

Texrope centres 118".

Necessary Texropes.

Two Drum Washers each 3'-0" diameter  $\times$  3'-6" wide, covered with honey comb sheet brass and wire gauge with driving and raising and lowering gear.

One 12" bore gunmetal stuff value in the bottom of each Breaker and one 5" bore washout valve. PRICE Rs. 45,000

## THE HYDERABAD CONSTRUCTION COY., LTD.

Three 60 B. H. P. Motors for driving the Breakers,  
Squirrel Cage Type 400/440 volts 3 phase, 50  
cycles ball bearings, fitted R. P. M. about 975  
Pulley 12" diameter, grooved for 7'-1½" texropes.

Three Totally enclosed Oil Immersed Floor Mounting  
Auto-Transformer Starters, fitted for one no-volt  
and two overload Releases with time lags, iron  
ammeter, bedplate and rails. PRICE Rs. 8,750

Two Storage Tanks for storing the plup as it leaves  
the Breakers, bodies of reinforced concrete, each  
16'-0" diameter × 7'-0" deep complete with mixer  
gear. PRICE Rs. 6,000

One 20 B. H. P. Squirrel Cage Type Motor for driv-  
ing the gear of the Two Storage Tanks, 400/440  
volts, 3 phase, 50 cycles, ball bearing fitted, speed  
and size of pulley to be decided later.

One totally enclosed Oil Immersed Floor Mounting  
Auto-Transformer starter fitted for one no-volt  
and two overload Released with time lags iron  
ammeter, bedplate and rails. PRICE Rs. 1,000

One Centrifugal Pump and direct coupled motor for  
pumping pulp to Strainers Motor 25 B. H. P.

Note : This Pump may be a duplicate of pump for  
handling pulp from wash tanks. PRICE Rs. 4,580

Two Super " Tremor " Strainers, working in conjunc-  
tion with Two Auxiliary Strainers constructed as  
follows :—

Super Strainers to have drums 85" × 25" Auxiliary  
Strainers 48" × 30" vats of cast iron.

Drums of phosphor bronze sheets with brass ends  
(fitted with loose trunnions) with trumpet mouth  
pieces at either end to steady the flow of the  
screened stuff into the discharge trough.

## THE HYDERABAD CONSTRUCTION COY., LTD.

Bearings driving shaft to be carried upon two self-oiling watertight plummer blocks, and adjustable eccentrics having a through ranging from  $1/32''$  to  $3/16''$  running at about 480/500 R. P. M.

Stroke changing gear.

Necessary driving gear for Strainers with cone pulleys.

One pulp Thickner or Concentrator to work in conjunction with the above Strainers, constructed generally as follows :—

Vat of Cast Iron

Decker Roll  $114'' \times 36''$ .

Couch Roll  $106'' \times 19''$ .

Drum of Phosphor Bronze with wire cloth, shaft to be carried in Ball Bearings of the Waterproof Type.

The joints forming the seal between the drum ends and vat to be carried in such a manner that the felt can be taken up to allow for stretching without putting under friction upon the revolving drum. Couch Roll to be effectively balanced to give the most suitable pressure for concentrating the pulp and to be fitted with a Doctor.

There should be ample provision for cleaning the vat.

Necessary driving gear.

PRICE Rs. 39,000

One 30 B. H. P. Motor and Starter for driving the Strainers and Concentrator through Counter shafting.

Motor of the Squirrel Cage Type 400/440 volts 3 phase, 50 cycles, ball bearing fitted, speed and size of pulley to be decided later. One totally enclosed Oil Immersed Floor Mounting Auto-

Transformer Starter fitted with one no-volt release and two overload releases, with lime lags, iron ammeter, bedplate and rails.

PRICE Rs. 1,200

## THE HYDERABAD CONSTRUCTION COY., LTD.

One Centrifugal Pump of the Open Impellor Type, casing of cast iron, impellor of bronze pump rod of bronze in bronze sleeves, ball bearings, 4" section  $\times$  3" bore delivery, coupled through a flexible coupling to a 10 B. H. P. Motor of the Squirrel Cage Type, 400/440 volts, 3 phase, 50 cycles, ball bearing fitted.

One totally enclosed Oil Immersed Floor Mounting Auto-Transformer Starter, fitted with one no-volt release and two overload releases, with time lags, iron ammeter, bed plate.

PRICE Rs. 1,600

Two Storage Tanks or Stuff Chests for storing the thickened Pulp as it leaves the Concentrator.

Bodies of Tanks in reinforced concrete.

Mixer and Gearing as previously described.

PRICE Rs. 6,000

One 20 B. H. P. Motor and Starter for driving gearing of Stuff Tanks as aforesaid described.

PRICE Rs. 1,000

One Centrifugal Pump and Direct Coupled Motor for pumping concentrated pulp from the Storage Tanks into the Potchers or Bleaching Engines.

Pump of the Split Casing and end suction type, shaft of monel metal, impellor of cast steel, fitted sleeves of phosphor bronze fitted, ball bearings, suction 12" bore, discharge 8" bore.

Coupled through a Flexible coupling to a Squirrel Cage Type Motor 400/440 volts 3 phase, 50 cycles roller or ball bearings.

Trifurcating box to be provided.

Starter of the totally Oil Immersed Floor Mounting Auto-Transformer Type, fitted with one no-volt release and two overload releases with time lags, iron ammeter, combined cast iron bedplate.

PRICE Rs. 4,580

Six Potchers or Bleaching Engines each 24'—0" long  $\times$  12'0" wide of an average depth of 5'—0" bodies

## **THE HYDERABAD CONSTRUCTION COY., LTD.**

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to be made of reinforced concrete in situ, each to be fitted with a 12/8" Centrifugal Pump to the Non-Clog Type, pump to have Split casing and end suction and capable of handling pulp up to 6% consistency.

Shaft of monel metal and impellor of cast steel, phosphor bronze liners, water proof ball bearings.

Pulley 16" diameter, grooved for 5'—7/8" Texropes

One Drum Washer 4'—0" diameter × 5'—0" long covered with honeycomb sheet brass and wire gauze, with raising, lowering and driving gear.

One sand trap in the bottom of each Potcher to be covered perforated bronze plates.

One 12" bore gunmetal stuff valve in the bottom of each Potcher and one 5" bore washout valve. PRICE Rs. 30,000

Six 25-30 B. H. P. Motors for driving the above Potchers through Texrope drive as above

Squirrel Cage Type 3 phase, 50 cycles Totally Enclosed Oil Immersed Floor Mounting Auto-Transformer Starters, fitted with one no-volt and two overload releases with time lags, iron ammeter, bedplate and rails. PRICE, for six Rs. 8,500

One 15 B. H. P. Motor and Starter for driving the sixsets of wash Drums through necessary counter shafting, Motor of the Squirrel Cage Type 400/440 volts, 3 phase, fitted with belt driving pulley.

Totally enclosed Oil Immersed Floor Mounting Auto-Transformer Starter fitted with one no-volt and two overload releases, with time lags, iron ammeter, bedplate and rails. PRICE Rs. 700

Two Storage of Blending Tanks for the Bleached Pulp. bodies of reinforced concrete, each 16'—0" diameter × 7'—0" deep, with mixing Gear as aforesaid. PRICE Rs. 6,000

# THE HYDERABAD CONSTRUCTION COY., LTD

One 20 B. H. P. Motor and Starter for, driving the gearing of the two Mixers, as aforesaid. PRICE Rs. 1,000

One Centrifugal Pump and Direct Coupled Motor and Starter for filling the Beaters this pump is as already described for filling the Potchers. PRICE Rs. 4,580

Six Beating Engines of the Hollander Type each 10-12 cwts capacity having reinforced concrete bodies built on the spot, 18'-0" long x 9'-0" wide x 32" and 48" deep Rolls 56" diameter x 56" long fitted with best quality crucible steel or phosphor bronze as the case may be, bars working against bedplates having steel or phosphor bronze bars (three spare bedplates and roll knives) for the set.

The rolls to be cast in one piece accurately balanced and securely fitted to heavy forged steel shafts to run in roller type water tight bearings, bearings to be carried in parallel roll lifting gear.

Fittings sand trap in bottom covered with bronze perforated plate.

Roll covers to be of cast iron sides and wood lagging with usual front and tail boards.

String Catcher with hand wheel for raising and lowering.

One Drum Washer 4'-0" diameter x 4'-0" long, covered with honeycomb sheet brass and wire gauze, with raising and lowering and driving gear.

One 12" bore gunmetal stuff valve in bottom of each Beater, and one 6" bore washout valve.

Driving pulley arranged for Texrope Drive 96-1/8" diameter, grooved for 7'4 1/4" Texropes

PRICE Rs. 1,04,000

Six 65 B. H. P. Motors for driving the Beaters, Squirrel Cage Type, 400/440 volts, 3 phase, 50 cycles, suitable for speed to be later arranged.

Totally Enclosed Oil Immersed Floor Mounting

## **THE HYDERABAD CONSTRUCTION COY., LTD**

Auto-Transformer Starters, fitted with one no-volt and two overload releases with time lags, iron ammeter, bedplates and rails.

Pulley 12" diameter, grooved 7'-1 $\frac{1}{4}$ " Texropes.

PRICE Rs. 18,000.

Two Stuff or Storage Chests for receiving Pulp from Beating Engines, each 16'-0" diameter  $\times$  7'-0" deep, bodies in reinforced concrete, Mixer Gear.

PRICE Rs. 6,000.

One 20 B. H. P. Motor and Starter, for driving the above gear in the two storage tanks.

PRICE Rs. 1,000

One Centrifugal Pump and direct coupled Motor for delivering the Pulp to the Storage and Mixing Tanks at the Paper Making Machine.  
Pump 12/8" Motor 25 B. H. P. all as previously described.

PRICE Rs. 4,580.

Two Stuff or Mixing Chests for feeding Paper Machine, each 16'-0" diameter  $\times$  7'-0" deep, bodies of concrete, mixing gear.

PRICE Rs 6,000.

Sand Tables to be made of wood at site.

PRICE Rs. 1,500.

### **PAPER MAKING MACHINE.**

One Super "Tremor" Strainer fitted with Auxiliary Strainer, to be driven off countershaft.

Drum of Tremor Strainer 90"  $\times$  42"

Drum of Auxiliary Strainer 60"  $\times$  30"

Generally to aforesaid Specification for Strainers, but vat to be lined with monel metal.

PRICE. Rs. 17,000

Paper Making Machine capable of producing finished Paper 120" wide, necessary copper pipe to lead the pulp from Strainer to breast box.

Breast Box to be of the most improved type made of mahogany with brass fittings and to be arranged

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

to spread the pulp uniformly over the full width of the wire.

Wire Frame to be arranged to run a wire 130" wide × 64" long, comprising:—

Two Heavy Side Bars with necessary supports.

Bronze breast roll 15" diameter × 132" long.

Brass tube rolls 5" diameter × 132" long.

Guide roll 10" diameter of copper 134" long, with automatic guide and swivelling bearing front and back.

Five Copper wire Rolls each 8" diameter × 132" long.

• Bronze Couch Rolls 20" and 26" diameter × 134" long with cast iron ends and steel gundgeons.

One Rubber Covered Pressing Roller to work against the top couch roll carried in brackets and to be provided with springs.

Three Wood Vacuum Boxes each 11" wide of best construction monel metal tops brass fittings and instantaneous couplings at back.

Save-all of corrugated Copper.

Four Spray Pipes.

One Spray Cutter.

One Improved Deckle with strong and deep slice arranged to suit a speed of 350 feet per minute.

One Pair of Deckle Straps with carrying pulleys.

The Framing at the Vacuum Boxes to be cast hollow and provided with all necessary taps for water service pipes.

## **PRESS ROLLS.**

Two Sets of Press rolls 22" diameter × 130" long covered with india rubber  $\frac{3}{4}$ " thick.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

The first top roll to be of granite 26" diameter, the second top roll to be covered with a bronze shell  $\frac{3}{4}$ " thick.

Press Roll Brackets to be of an improved type to give the utmost facility for changing felts.

Each top roll to be fitted with a travelling doctor having a bronze blade.

Below each bottom there is to be fitted a galvanized tray.

The wet Felt Rolls to be fitted with steel tubes 12" diameter covered with vulcanite or Bakelite.

The ends of these rolls to be of forged steel and welded in.

One Felt Vacuum Box to be placed in front of the first press rolls.

Wet Leading Rolls to lead the Paper into the second press and to the first cylinder.

Four Leading Rolls of Brass with thorough going spindles, bearings and driving pulleys.

Framing at Press Rolls to be of best design carefully machined where necessary and arranged to give the greatest facility for changing felts.

## **DRYING CYLINDERS.**

Eighteen Drying Cylinders each 5 ft. diameter  $\times$  128" long and to be fitted with convex ends, manhole door in each in the back ends, water lifting buckets and water traps.

The Cylinder to be carefully turned, ground and polished while running in their own bearings and to be carefully balanced.

Steam and Exhaust connections of the ball and socket type 2" inlet with 2" bore gland cock.

# **THE HYDERABAD CONSTRUCTION COY., LTD**

Spur wheels to be machine cut 2" pitch with eyes split and bolted to facilitate removal.

Eighteen Steam Traps of ample capacity for the aforesaid cylinders.

Felting to be so arranged that three felts will cover four cylinders one felt will cover three cylinders one felt will cover two cylinders and one felt will cover one cylinder.

Roll to be 12" diameter fitted with forged steel ends.

Steel welded in, carefully ground then covered with a thin coating of zinc and polished, and to be carried in bearings having self-contained lubricators,

Cylinder framing to be arranged to suit 12" diameter felt rolls.

Rolls between the cylinders to be arranged as stretcher roll.

Automatic felt guides to be provided for each flight.

## **CYLINDER DOCTORS.**

Doctors to be provided for the first three top cylinders and all the bottom cylinders, second in all and to be of the travelling type, gearing for travelling them to be placed at the back of the Machine.

## **SMOOTHING ROLLS,**

One pair of Chilled Iron Smoothing Rolls 16" and 11" diameter carried in open faced brackets hand-wheels and screws for lifting the top roll. Travelling doctors with steel blades for both rolls.

## **LEADING ROLLS.**

Two Leading Rolls at the smoothers of brass 8" diameter to be carried in spring brackets.

The leading roll at the last cylinder to be of steel 12" diameter with forged steel ends welded in and carried in suitable springs brackets.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

## **CALENDERS.**

Two Sets of Chilled Rolls each having six rolls 22", 15", 14", 15", 14", and 18" diameter,  $\times$  126" face to be carried in open faced brackets with gunmetal bushed bearings, the bottom bearings to be of heavy design to carry the total weight of the rolls.

Compound lever's and weights to be fitted to give a pressure of 30 cwts. to each end of the top rolls.

The two 14" roll in each set to be bored and fitted with steam and exhaust connections of the ball and socket type front and back.

Doctors are to be provided for all the calendar rolls with suitable steel blades and brackets.

Damper, one to be arranged between the last calender and the reel.

## **REEL GEAR.**

One Pair of Brackets to carry Two Reels, the front bearings are to be adjustable.

Two separate driving gears with shafts and spur wheels at back.

Each shaft to be fitted with fast and loose pulleys and belt shifters.

## **REELS.**

Twenty-Four Steel Reels each 12" diameter  $\times$  136" long on body with forged steel ends welded in and with suitable pinions keyed on.

Soleplate, to be of box section 12 $\frac{1}{2}$ " and 15" wide  $\times$  3" deep and to extended from the breast roll to the reel with all the necessary foundation bolts and plates to suit concrete foundation.

## **DRIVING GEAR**

The Gearing to be arranged to run the Machine at all speeds from 35 to 350 feet per minute from a Compound variable speed Steam Engine of no

# **THE HYDERABAD CONSTRUCTION COY., LTD**

less than 186 B. H. P. when receiving steam at 250 lbs. per square inch (saturated) and at a back pressure not exceeding 35 lbs. per square inch.

Engine to be complete with all necessary gearing and drive to Machine.

One Shaft for the couch rolls.

Two Shafts for the press rolls.

Two Shafts for the Cylinders.

One for the smoothers and two for the calenders.

Each shaft is to be provided with a large pulley fitted with friction clutch carried on a heavy shaft running in gunmetal bushed ring oiled bearings.

These shafts to connect to the various parts of the Machine with flexible couplings for all the drives except the cylinder drive, the clutch levers to be brought to the front of the Machine.

The main pulleys to be driven by pulleys on overhead shafts carried on heavy bearings and driven by means of rope or V belt pulleys from the main shaft.

The main may be driven by plain or V pulleys to the main cylinder section, all the others to be either cone pulleys with suitable belt shifters or the under pulleys will be flat will cone pulleys above all to be fitted with transformers to enable any width of belt to run perfectly on cones, the belt shifter in that case will be fitted to operate the transformer and the brackets are to be made so that the overhead shafts can be lifted and lowered to tighten the belt as required.

## **BACKSHAFTING.**

All necessary Backshafting to drive the Strainers, shake motion, vacuum pump and back water pump, shaft to be carried from wall brackets and fitted with ball bearings of the waterproof type.

# **THE HYDERABAD CONSTRUCTION COY., LTD**

A pulley to receive the drive which may be of the V belt type, suitable powered variable speed Compound Steam Engine.

Shake Motion to be of the improved type with a long cone connected by means of friction clutch to a shaft, a flywheel, steel shaft with ball bearing of the waterproof type to be fitted, suitable brackets and soleplate.

Stroke varying apparatus to enable the length of stroke to be altered while running as also a belt shifter. Corresponding cone pulley to be fitted on the overhead back shaft.

## **VACUUM PUMP.**

One 6" Bore Rotary Vacuum Pump having brass case, brass revolvers, machine cut wheels, steel shafts, running in waterproof ball bearings, all on a heavy cast iron bedplate.

Back Water Pump to be of the Centrifugal Type 10" bore inlet and 9" discharge with brass case, brass cover, monel metal spindle and waterproof ball bearings, pulley.

Excess Water Pump to be 4" bore having brass cover, brass case, brass impellor monel metal spindle, waterproof ball bearings, pulley.

## **PIPING.**

The following Piping and Connections are to be provided :—

Copper suction and discharge piping cast iron suction and discharge piping from backwater pump with a suitable valve at the sandtables.

A copper Suction bend for the excess at water pump.

Rubber hose pipes with copper connecting pipes and instantaneous couplings for Vacuum boxes.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

Cast iron piping to the pump with discharge piping to the low water box to be provided by Mill Owners.

All Necessary Steam and Exhaust Piping for the Cylinders, Smoothers and Calenders to be provided.

Platforms Cross Gangways at Couch and Press Rolls, with baulsters and brass cased hand rails, chequer plate flooring in M. S.

One gangway in the front of the cylinders with cast iron brackets and M. S. chequer plate flooring.

One gang way at back of cylinders to be provided with C. I. brackets, M. S. chequer plate flooring and wrought iron pipe handrails with one C. I. stair at press roll and one near the centre of the cylinders and one at the calender end.

Stairs to be C. I. sided, C. I. treads, cast iron balusters and wrought iron hand rails.

Wheel guards are to be provided for the hole of the wheels those for the cylinders being carried from the gangway brackets and to be made easily removable.

## **LUBRICATION.**

The wire rolls, wet and dry rolls felt rolls to have totally enclosed bearings with self-contained lubricators.

Main shafting will have ball bearing grease lubricated.

Bottom press rolls and cylinders arranged for solified oil.

Furnishing to include :—

Two Sets of Wire.

Two Pairs of Deckle Straps.

Six Aprons.

## **THE HYDERABAD CONSTRUCTION COY., LTD.**

Six Rubber Connections between breast box and breast board.

Two Complete Sets of Felts.

One Set of Belts, Ropes as the case may be

### **SUPER CALENDER.**

One 10 Roll Super Calender to be of the highest class construction with five chilled and five woolen paper rolls, carried in open face brackets of heavy design bearings for the bottom and top rolls to be of the roller or ball bearing type.

Central roll bearings to be adjustable Compound levers and weights for applying a pressure of 15 tons to each top roll

Hand casing gear for relieving the pressure when lead-ind paper through.

Letting-off and winding up reel brackets with the necessary leading rolls.

Platform and stair with brass cased handrails to be supplied.

Roll casing gear for separating the rolls when the cylinders is stopped, arranged to be driven by an independent motor supplied by Machinery Marker.

One large driving pully to receive the drive from.

One Variable Speed Motor about 9 B. H. P.

Specification to be issued by Maker of Super Calender.

### **REELING MACHINE.**

One Drum Reeling Machine arranged with four webbs, comprising :—

Letting off reel gear with traverse motion and automatic brake.

One steel measuring drum with five figure counter.

## THE HYDERABAD CONSTRUCTION COY., LTD.

One sitter shaft with five slitting knives.

Leading rolls to lead the paper to the winding up spindles.

One winding-up drum 36" diameter with two shafts and four sets of lever arms, these to be fitted with bearings adjustable both ways.

Necessary winding-up reel spindles.

Machine arranged to run up to as high a speed as may be desired, driven by Motor 8-10 B. H. P.

Specification to be issued by Reeling Machine Maker.

One Duplex Paper Cutter arranged to take six reels and comprising:—

Heavy reel frames with adjustable bearings.

One pair of cast iron draw rolls.

One pair of slitter shafts with five pair of slitting knives

One spare set of knives

Two sets of gathering rolls with the necessary leading rolls

Two revolving knives and dead knives driven by expanding pulleys and change pulleys to cut all sizes of sheets from 14" to 60." inclusive.

One delivery felt and one laybay to lay four widths and arranged to be driven by means of belt pulleys from.

A Motor Power and Specification to be issued by Paper Cutter Machine Maker.

One Guillotine to cut 48" wide of the highest class self clamp type, arranged to be driven by a Motor power and specification to be issued by Guillotine Machine Maker.

## **THE HYDERABAD CONSTRUCTION COY., LTD**

One Baling Press with lifting and lowering pulleys with belt shifters four upright columns and cast iron tables, each 5 ft. between the columns  $\times$  3' - 4" wide, with driving motor power and specification to be issued by Press Maker. PRICE Rs. 5,00,000

### **Paper Transportation from Machine to and in the Finishing House**

The Paper will be transported by an Overhead runway from the Machine House to the Finishing House where it will be handled by a "Underhung Transporter Bridge Crane" and will link up with the aforesaid runway in order to bring the reels of of paper direct from the Machines to the Finishing House or guillotine as may be necessary.

### **EQUIPMENT.**

One Single Motor Underhung Electric Transporter Crane Bridge.

Span about 50 feet.

Travelling speed with full load comprising one fully loaded Electric Travelling Hoist Block, about 250 ft. per minute.

Power of Motor about  $3\frac{3}{4}$  B. H. P.

Electrical equipment and conductors on the Underhung Track suitable for service on an Alternating Current of 440 volts, 3 phase, 50 cycles.

Locking gear would be provided at one end of each Bridge for lining up with the Runways.

Gantry Brackets and Automatic Stops for fitting at the ends of the Runways supplied by Purchasers.

One Set of Gantry Conductors suitable for about 300 ft. long and provided with insulators and supports for carrying them.

The conductors to be suitable for service on an alternating current supply of 440 volts, 3 phase, 50 cycles.

# **THE HYDERABAD CONSTRUCTION COY., LTD**

Electric Conductors for Runways, each set of conductors to be suitable for use with a straight runway of about 150 ft. long; and arranged for service on an alternating current supply of 440 volts., 3 phase, 50 cycles.

One 2-Motor Cage Controlled Electric Travelling Hoist Block, Maximum gross load 1-ton, block tested to  $1\frac{1}{2}$  tons, hoisting speed with full load about 20 ft. per minute; travelling speed with full load about 125 ft. per minute electrical equipment suitable for service on an alternating current supply of 440 volts., 3 phase, 50 cycles.

Collector gear would have to be provided on the trolleys to engage with the bridge and Runway conductors.

One Remotely Hand Operated Turn Over Switch.

PRICE Rs. 20,147

## **WHITE WATER SAVEALL.**

White Water Saveall for white water from Paper Machine :—

There are various ways of handling this, as masonry would be cheap at Sirpur I make the preliminary proposal that a series of masonry tanks somewhat like the tanks used in Sewage Treatment might be adopted, in which the White Waters could be run into and allowed to settle, the clear water being pumped back into the Mill service.

The Settled out portion (Pulp and China Clay) is reclaimed and used in the Mill Furnish.

It is essential both for water, pulp and China clay economy that a Seveall System be installed.

I therefore provisionally allow the sum of	....	Rs.	24,000
Pipe Lines and Valves	....	Rs.	50,000
Cables and Lighting	....	Rs.	40,000
Laboratory Furnishing	....	Rs.	4,000

# THE HYDERABAD CONSTRUCTION COY., LTD

## BOILER PLANT Section 2.

Will comprise :—

TWO 4-DRUM VERTICAL TYPE WATER TUBE BOILERS, each having a heating surface of 6,500 square feet, Indian Rating, constructed suitable for a working pressure of 300 lbs. per square inch, and to be capable of a normal evaporation of 30,000 lbs. of steam per hour each, with an overload evaporation of 37,500 lbs. of steam per hour each. To be complete with all supporting Steelwork and all necessary steam and water fittings of approved design.

TWO SUPERHEATERS suitable for working in conjunction with the above Boilers and capable of raising the temperature of the steam by 250 F.

TWO SETS OF NATURAL DRAUGHT MECHANICAL CHAIN GRATE STROKERS suitable for burning Coal having an ash content 18-20% and a calorific value 10,500-11,000 B. T U. S. per lb. Stokers to be complete with necessary Taper arche Bricks for forming the furnace arches and a fire clay.

Each Stroker to have its own independent Unit Drive.

TWO TETS OF "DIAMOND" SOOT BLOWING EQUIPMENT comprising the necessary elements, valves and piping.

NECESSARY 85% MAGNESIA LAGGING MATERIAL for gaining the exposed portion of the boilers and Superheaters.

NECESSARY GALLERY AND LAGGING EQUIPMENT for legging access to the top of the Boilers and Superheaters.

TWO COMPLETE SETS OF BOILER HOUSE INSTRUMENTS for the control of the Steam Plant Equipment.

TWO GREENS ECONOMISERS, complete with necessary Driving Gear, Motor Reduction Gear, all necessary fittings, control Dampers, etc.

ONE M. S. SELF SUPPORTING CHIMNEY 200'-0" high  $\times$  10'-0" diameter at the top, with inspection ladder, holding down bolts, etc.

NECESSARY COMPLETE PIPEWORK INSTALLATION to include Main Steam, Auxiliary Steam, Hot and Cold Feed and Blow Down

# THE HYDERABAD CONSTRUCTION COY., LTD.

Piping, necessary valves for operating, supports, bolts, nuts jointing material, with 85% Magnesia Lagging for lagging all Steam and hot water pipes.

Hot Well with top and manhole, necessary flange connections.

TWO WEIR DIRECT ACTING STEAM DRIVEN BOILER FEED PUMPS, each to be large enough to feed the two boilers on full overload.

ONE WATER SOFTENING PLANT having a capacity of 5,000 gallons of water per hour.

ONE COAL CRUSHER for crushing the rubble coal to a size suitable for the Stockers, with elevator, and coal conveyor. Motor for driving same.

PRICE Rs. 4,50,000.

## SODA RECOVERY PLANT AND CAUSTICISING. Section 3.

ONE CENTRIFUGAL PUMP OF THE OPEN IMPELLOR TYPE for pumping the liquor from the Digestors to the Soda Recovery Plant.

Pump casing of the split type and of cast iron, cast steel impellor monel metal pump shaft, ball or roller bearings to pump, pump suction 4" bore, delivery 3" bore, pump coupled through a flexible coupling to a 10 B H. P. Motor 400/440, 3 phase, 50 cycles, squirrel cage type motor, with autostarter, ammeter, etc., combined base plate.

PRICE .... Rs. 1,600.

TWO M. S. ELECTRICALLY WELDED TANKS to be fixed on an overhead staging each having a capacity of about 2,500 gallons, plates 3/8" thick, 4" bore outlet to each, 3" bore washout plug and seat.

PRICE .... Rs. 5,250.

ONE TRIPLE EFFECT EVAPORATOR having a heating surface of 5,000 sq. ft. bodies, bottom, tops and hoods in cast iron.

Calendrias of M. S. Electrically Welded throughout.

Tube plates of M. S. stayed with throughfare bolts and nuts.

## THE HYDERABAD CONSTRUCTION COY., LTD.

Heating surface to be contained in 2" O. S. bore Swedish Charcoal iron tubes, well expanded into the tube plates. In the hood of each there is to be an effective entrainment preventor.

Vapour Pipes between the vessels to be of C. I. flanged and to the following dimensions :—

First to second 23" bore

Second to third 28" bore.

Third to condensor 36" bore.

Fittings will comprise :—On the Calandria of the first Effete High and Low Pressure, steam valves, steam relief valve, water gauge fittings, steam pressure gauge, steam trap of ample capacity to deal with the condensed water from the calandria.

Body 4" bore feed valve C. I. Body with monel and rubber valve, no brass or gunmetal are permissible on the liquor sides.

Gauge fittings for liquor.

Thermometer.

Dome combined pressure and vacuum gauge.

Steam and washout connections.

Sight glasses.

Noxious gas connections.

Manholes.

Fittings for second and third Calandrias,

Vapor connections.

Combined Vacuum pressure gauges.

Water gauge connections.

Connections for condensed water to super lifting condensed water traps of ample capacity for the second and third Calandrias.

Bodies, feed valve for liquor.

Liquor Gauge.

Thermometer.

Vacuum Gauge.

Air release or vacuum breaking valve,

Sight and Light glasses.

Noxious Gas connections.

Liquor outlet from third vessel.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

Test cock on third vessel.

Steam and washout connections.

C. I. connecting pipes between vessel for liquor.

ONE DUPLEX STEAM DRIVEN FEED PUMP  $7\frac{1}{2}" \times 4\frac{1}{2}" \times 10"$  pump end of cast iron, with suitable air vessel, pistons of C. I. Pump piston rings of C. I. valves of stainless steel or monel metal.

Note:—There must be no brass contact.

ONE CONCENTRATED DUPLEX STEAM DRIVEN PUMP with C. I. Receiver, necessary vacuum connections to receiver and pump.

Size of pump  $6' \times 4' \times 6'$ .

Pump and C. I. ball valves, piston and rings C. I.

M. S. STAGING for carrying the aforesaid Evaporator working platform to be 12'-0" above floor level, staging suitably stayed and braced, complete with stairways and platforms, which are to be covered with M. S. chequer plates W I handrails.

C. I. Vapour Pipe 36" bore between the last Effete and the condensor.

ONE C. I. CONDENSOR 4'-6" diameter  $\times$  9'-0" long in parallel portion.

C. I Tail pipe with steel, water inlet 9" bore air 6".

C. I. Outside water separator.

M. S. Air and water piping.

ONE MOTOR DRIVEN CENTRIFUGAL WATER INJECTION PUMP for condensor capacity 72,000 gallons of water per hour against a head of approximately 50 ft.

Pump C. I. body split casing type. impellor of bronze spindle of monel metal, bronze liners, ball bearings.

The pump to be direct coupled through a flexible coupling to a 32 B. H P. Motor 400/440 volts, 3 phase, 50 cycles, squirrel cage type.

One Totally Enclosed Oil Immersed Floor Mounting Auto-Transformer fitted with no-volt and two overload releases.

Iron ammeter C I. base plate.

# THE HYDERABAD CONSTRUCTION COY., LTD.

ONE FOOT VALVE, AND STRAINER

ONE SLUICE VALVE on delivery side.

ONE REFLUX VALVE on delivery.

PRESSURE AND VACUUM GAUGES on pump.

ONE PUMPING SET as above but to have a Motor of 40 B. H. P. for working Spray Cooling System.

ONE HORIZONTAL DRYSLIDE VALVE VACUUM PUMPING ENGINE, pump cylinder 18" bore steam cylinder 11" bore, stroke 18", Complete with all gearing.

Pump gear to be on the top of the pump chamber.

ONE SPRAY COOLING SYSTEM, Masonry Tank.

ONE M. S. FEED TANK FOR ROTARY FURNACE, 750 gallons capacity, electrically welded,  $\frac{1}{2}$ " plates.

Tank to be fitted with a closed steam coil for heating the feed liquor, 3" bore outlet with C. I. lubricated cock.

PRICE .... Rs. 87,000,

ROTARY FURNACE comprising :—

The Shell to be 8'-0" internal diameter  $\times$  30'-0" long, over end plates constructed of M. S. plates  $\frac{1}{2}$ " thick, with angle steel rings securing end plates; tee bar strengthening rings; steel to be strengthened internally by eight longitudinal steel tee base 4'  $\times$  4"  $\times$   $\frac{1}{2}$ " secured to end plates by gussets. Three circumferential supporting and running rails 6" wide with cambered treads and to be fastened through packing plates by countersunk bolts, rails to be truly circular after fastening to shell.

Three pairs of supporting wheels having cast iron centres with steel tyres 3' diameter, shrunk on tread to be machined to suit camber on rails; wheel mounted on steel axles running in double row Roller Bearings and mounted on heavy cast iron baseplates.

Driving Gear to consist of cross shaft with fast and loose pulleys and double helical bevel pinion, second motion shaft, fitted with double helical driven wheel and spur pinion, the latter to engage in segmental spur rack bolted to machined tee bar rings on shell.

The two shafts to run in double row roller bearings.

# **THE HYDERABAD CONSTRUCTION COY., LTD.**

Eye Plate to be of cast iron for inlet end of Rotary Furnace with cast iron segmental blocks, bolted to the eye plate.

Two liquor inlet pipes (one stand by) and to be provided with one cleaning plug, one 2½" bore liquor cock, charging funnel and piping between the charging funnel and inlet pipe.

Cast iron Segmental Blocks to be fitted to the outlet end of the Furnace; a cast iron cleaning door in flue and cast iron plate for supporting flue at back of furnace.

One Cast iron Ash Discharge door with necessary discharge chutes and adjustable shutter.

Auxiliary Furnace Fittings to comprise :—Firebars and bearers, furnace mouth with door in halves and wrought iron air regulators, deadplate, ashpit frame and water trough; damper with chains, guide pulley angle iron ring for back face of furnace brickwork to encircle the ring of outlet block.

Necessary Firebricks, moulded and tapered shapes for lining the shell of the above rotary furnace, with fireclay and cement.

ONE M. S. SELF SUPPORTING CHIMNEY for working the above Rotary Furnace.

One 25 B. H. P. Back geared Motor and starter for driving the above Furnace details of drive will have to be settled with Makers of Rotary Furnace.

PRICE .... Rs. 55,750

## **CAUSTICISING PLANT.**

TWO M. S. ELECTRICALLY WELDED ASH DISSOLVERS each 8'-0" diameter × 6'-0" deep, constructed of 3/8" plates and angles, complete with Agitating Gear, perforated steam pipe M. S. perforated bottom and screens.

PRICE ERECTED .... Rs. 6,000.

ONE DOUBLE RAM STEAM DRIVEN PUMP, pump rams 6" diameter, for delivering strong liquor to Causticisers.

PRICE ERECTED ... Rs. 5,500.

TWO M. S. LIME SLAKERS, electrically welded plate ½" and angles

# THE HYDERABAD CONSTRUCTION COY., LTD.

6'-0" diameter X 4'-6", deep, agitating gear and screens

PRICE ERECTED ..... Rs. 4,500.

ONE BELT DRIVEN PUMP, pump ram 6" diameter for delivering Milk of lime to causticisers.

PRICE ERECTED .... Rs. 2,500.

TWO M. S. CAUSTICISERS, each 14'-0" diameter x 11'-0" deep, of  $\frac{1}{2}$ " plates and angles, rivetted in position, agitating gearing perforated steam pipe, run off siphon, necessary valves.

PRICE ERECTED .... Rs. 24,000.

ONE M. S. LIME MUD RECEIVING TANK, 12'-0" diameter x 6'-0" deep, fitted with agitating gearing, perforated steam pipe, run off siphon, etc.

PRICE ERECTED.... Rs. 8,000

ONE ROTARY FILTER for filtering the Lime Mud, comprising:—

Drum (5'-0" diameter x 4'-6" wide) drum to be made of C. I. and clothed with Monel Metal Gauze, Vot of M. S. electrically welded,

Speed of drum to be about  $1\frac{1}{2}$  R. P. M.

Vacuum Pump 160 C. F. T. per minute displacement.

Power Requirements for filter, Vacuum Pump, filtering pump 15 B. H. P.

Motor Starter, PRICE ERECTED.... Rs. 15,000.

ONE CENTRIFUGAL PUMP and B. H. P. Motor as described for handling strong caustic Liquor. PRICE ERECTED.... Rs. 1,000.

ONE DITTO for Weak Liquor. PRICE ERECTED.... Rs. 1,600.

THREE SECOND HAND BOILERS SHELLS to act as strong liquor settlers.

PRICE ERECTED .... Rs. 4,500.

ONE 50. B. H. P. MOTOR AND STARTER for main line shafting, details after outlay is settled.

M. S. STAGING to carry the Plant. (To be made locally)

PRICE ERECTED .... Rs. 10,000

Allowed sum for Pipes and valves ... Rs. 5,000

Rs. 2,37,800

# THE HYDERABAD CONSTRUCTION COY., LTD.

## ELECTROLYTIC BLEACH & CAUSTIC PLANT Section 4.

*45 Cylindrical Cells 43 for Duty and 2 as Standbye.*

43 Cells will produce daily (24 hours) 2,709 lbs. of Chlorine, and 2,953 lbs. of NaOH (Caustic Soda)

The Chlorine will be absorbed in Milk of Lime to form Bleaching solution.

Each Cell to be complete with liquor and gas connections, Cathodes and Anodes.

Cells to produce under the following average conditions:—

Percentage of NaOH in Cell Outlet Liquor	....	8.5
Percentage of Chlorine in Gas	....	98.0
Pounds of NaOH per Cell per day	....	71.0
Pounds of Chlorine per Cell per day	....	63.0
Pounds of NaOH per Kw. Hr.	....	.85
Pounds of Chlorine per Kw. Hr.	....	.79
Average amperes per Cell	....	959-1000.
Average Volts per Cell	....	3.5
Current Efficiency	....	94.5
Power Efficiency	....	62.0
PRICE	....	Rs. 40,500.

ONE MOTOR GENERATOR SET consisting of one D. C. shunt wound generator 165 Kw. 165 Volts, 1000 amperes, 960 r. p. m. of the open protected type with end shield, ball or roller bearings, flexible coupled to one A. C. 3 phase, 50 cycles, open protected type induction motor developing 265 B H, P. at 960 r. p. m. One C. I. bedplate for both Machines.

ONE SWITCHBOARD consisting of one marble panel with self-supporting iron framework and wire net side enclosure with one door mounted there-upon.

# THE HYDERABAD CONSTRUCTION COY., LTD.

## *For the A. C. Motor:-*

ONE TRIPLE POLO AIR BREAK circuit breaker with thermal overload, magnetic short circuit and no-volt releases, 350 amps, back of board type with free operating handle in front for direct on line starting.

## *For the D. C Generator:-*

One D. P. Air Break circuit breaker with thermal overload, magnetic short circuit and no-volt releases, 1000 amps, back of board type with free operating handle.

One ammeter with shunt 0-1500 amps flush type.

One voltmeter 0-260 Volts, flush type.

One Shunt Regulator with operating wheel in front.

Price, Erected. .... Rs, 12,500

One single Effete evaporator for concentrating the Cell Liquor, having 750 Sq. ft. of heating surface, body bottom and hood to be in cast iron.

Calandria of M. S. Electrically welded.

Tube plates of M. S. heating surface to be contained in 2" O. S. Diameter charcoal iron tubes.

Complete with high and low pressure steam fittings to calandria, steam relief Valve, pressure gauge, Vacuum gauge, water gauge, liquor gauge, sight and light glasses, manhole steam and washout arrangements, steam trap.

Underneath the bottom of the Evaporator there will be a salt separator or filter box constructed of C. I. with efficient drainage plate, steam and washout arrangements, swing door for removing salt from the drainer.

C. I. Connecting pipe to Condensor.

ONE HORIZONTAL SINGLE TYPE WET AIR PUMP WITH SPRAY TYPE CONDONSOR to be complete with all necessary fittings.

# THE HYDERABAD CONSTRUCTION COY., LTD.

ONE SINGLE RAM TYPE STEAM PUMP FOR FEEDING EVAPORATOR steam cylinder 4" bore, pump cylinder 2" bore, stroke 3", pump to be C. I. fitted,

ONE DITTO for handling concentrated liquor to Storage tanks,

M. S. Staging with staircase, platform and handrails for the afore said evoprator (May be made locally).

PRICE ERECTED .... Rs. 17,000

Salt Disolvers, Soda Tanks, Chlorine Absorbption Plant, etc earthenware pipe lines. etc,

Considerable portion can be made locally

PRICE ERECTED .... Rs. 1,31,000

Estimated cost of Electrolytic

Bleach and caustice Plant Rs 2,01,000

## POWER PLANT Section 5.

COMPRISING :—

*One 1750 kw. Turbo Alternator Set with Condensing Plant, Switchboard, Spray Cooling and Motor Generator Set for Mill Lighting.*

One Single Cylinder Steam Turbine of the impulse reaction design, of the automatic extraction type, both the main governor and pressure governor for the extraction to be controlled by oil pressure.

Maximum output measured at alternator terminals

with P. F. O. 8. .... 1750 Kw.

Speed of Turbine .... 5000 R. P. M.

Steam Superheat measured at Turbine Stop Valve .... 250. F.

Steam pressure measured at Turbine Stop Valve .... 290 lbs/sq. inch.

Cooling water Inlet Temperature .... 87. F.

Quantity of Steam to be extracted per hour .... 10,000 lbs.

Pressure of extracted steam .... 30 lbs.'sq inch.

# THE HYDERABAD CONSTRUCTION COY., LTD:

Helical Gear suitable to reduce the speed from 5000  
to 1500 R. P. M.

3 phase Alternator of the salient pole type with  
suitable built on exciter and field rheostat.

Maximum output measured at terminals p. f. o. 8. .... 1750 Kw.

Voltage across phases .... 440 volts

Frequency .... 50 cycles

Surfacing Condensing Plant comprising :—

One Surface Condensor for fresh water with brass  
tubes expanded into tube plates.

Pump set to consist of circulating water ejector and  
condensate pumps mounted on the same shaft and  
driven on one side by an auxiliary turbine, as on  
by a 3 phase motor, the normal drive would be  
by means of Motor and the turbine would take  
the drive automatically in case of failure of  
current supply.

To be included all accessories such as couplings,  
baseplate, oil cooler and all piping between,  
condensor, pump set, water jet ejector, oil  
cooler and oil tank.

## *Steam Consumptions.*

Under average conditions the following should be attained :—

Out put measured at Alternator terminal

with p. f. 0.8.	Kw.	1,750	1,400	700
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Steam consumption without

extraction ....	1 Lb/Kw. Hr.	11.6	11.6	12.3
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Steam consumption with

10,000 lbs/hr extracted	1 Lb/Kw. Hr.	15.1	16.0	21.2
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## *Switchboard Preliminary Proposal :*

To comprise :—

One 8-Panel Switchboard of roll section iron framework with  
sheet iron panels in front and sides, suitable for floor mounting and  
complete with all busbars, pilot lamps, interconnections.

One Generator Panel :—

One 3 pole oil circuit breaker with built on overload  
releases.

# THE HYDERABAD CONSTRUCTION COY., LTD

One Voltmeter.

One Kilowattmeter.

One Power Factor Meter.

One Exciter Voltmeter.

One Exciter Ammeter.

Six Panels for outgoing feeders each of them to comprise :—

One 3 pole oil circuit breaker with overload and no-volt releases.

One Ammeter.

One Panel for lighting circuit to comprise 3 pole disconnecting switches with fuses and ammeters.

One Spray Cooling Plant consisting of cast iron pipes with cast brass nozzles

PRICE .... Rs. 1,16,000.

## RAG BOILING Section 6.

TWO STUFF CHESTS FOR RAGS, each 16'-0" diameter × 7'-0" deep, bodies either reinforced concrete, complete with agitating gear, stuff and washout valves, fast and loose pulleys, belt striking gear.

PRICE .. Rs. 6,000.

ONE 20 B. H. P. MOTOR for driving the aforesaid chest of the squirrel cage type, 400 volts, 3 phase, 50 cycles, Totally enclosed Oil Immersed Floor mounting Auto-Transformer starter fitted with three overloads, time lags, one no-volt release, iron ammeter and trifurcating boxes.

PRICE. .... Rs. 1,200

ONE SPLITCASING END SUCTION CENTRIFUGAL PUMP SUCTION 12" bore delivery 8" bore, pump to be capable of handling pulp up to 6% consistency, and against a head of 30 ft. direct coupled through a flexible coupling.

A 25 B. H. P. Motor, 400 volts, 3 phase, 50 cycles, R. P. M. 750-800. One Totally Enclosed Oil Immersed Floor Mounting Auto Transformer Starter fitted as above Starter.

PRICE .... Rs. 4,580

ONE PULPER having a capacity of about 10 cwts. of rags or waste paper per hour.

## THE HYDERABAD CONSTRUCTION COY., LTD.

Machine to consist of a castiron hopper and semi-steel barrel provided with shaft and arms, all of the heaviest construction steam and water connections to the top hopper.

Main shaft not less than  $4\frac{3}{4}$ " diameter, fitted with manganese fitted to prevent wear on the shaft.

Barrels of semi-steel and a enlarged where strings collect round the main shaft, inside of the barrel to be fitted massive steel spikes, at the extreme driving end a Barring wheel must be fitted with safety clutch to facilitate starting up of the Pulper when same may have been left full of pulp, or for barring round for cleaning purposes.

Outlet end and middle of the shaft to be fitted with an improved impellor to give an automatically steady feed of pulp.

Bearings to be of ample size and self oiling and specially large stuffing boxes to be supplied.

Countershaft bearings to be mounted upon a solid bedplate bolted up to body of the Pulper.

Necessary driving gear and pulleys.

PRICE .... Rs. 7,000

ONE 50 B. H. P. MOTOR for driving same through reduction gearing squirrel Cage Type, 400 volts, 50 cycles.

Totally Enclosed Oil Immersed, Floor Mounting Auto-Transformer Starter, fitted with three overloads, time lags, iron ammeter, bedplate, etc.

ONE STUFF CHEST FOR PULPED RAGS OR WASTE PAPER BODY of reinforced concrete, 16'-0" diameter  $\times$  7'-0" deep, complete with agitating gear, stuff and washout valve, pulleys and belt striking gear.

ONE 10 B. H. P. MOTOR for driving same of aforesaid type.

ONE CENTRIFUGAL PUMP AND MOTOR duplicate of pump handling pulped rags from stuff chest.

This Pump will deliver pulp to bleachers as required.

PRICE .... Rs. 4,580.

## THE HYDERABAD CONSTRUCTION COY., LTD.

ONE GUILLOTINE RAG CUTTER having a capacity of 3 tons per hour, driven by fast and loose pulleys 36" diameter x 4½" wide, 100 R. P. M. belt striking gear, framework of cast iron.

ONE IMPROVED SQUARE CONICAL DUSTER 2' - 5" diameter, inside at the small end, 3' - 11½" diameter at the large end, 14' - 0" long, with conical delivery mouth piece, to be made of strong framing tied together by stays and covered with wire 3½ mesh, 13 W. G. thick.

The ends of the revolving part to consist of cast iron rings prepared to receive framework and turned "V" shape to run on the trunnions.

To have ten spikes for lifting the material.

To be carried by two cast iron stands, each with two Ring Oiled Bearings and Trunnions, the trunnions to work in bearings and brass steps.

To be driven by large wheel and pinion, with a countershaft 2" diameter, about 4 ft. long, supported on the framework of the Duster and running in pedestals and brass steps.

One pair of fast and loose driving pulleys, 16" diameter, 3" wide, belt striking gear.

The whole to be cased in with good strong framework with tonged and grooved boards.

The doors at the sides to be made loose so as to facilitate the removal of dust

ONE SPHERICAL REVOLVING BOILER, 8' - 0" diameter, with Gear and Fittings, for a working pressure of 60' per square inch.

The Boiler to be made of Siemens Martin Steel Plates, having a tensile strength of 28 to 32 tons and elongation of 20% in 8" with test certificate of same.

The Plates to be lap jointed and double riveted.

To have a manhole frame with opening 3'-0" x 2'-8" with internal steel strengthening plate secured with three rows of rivets, and to have internal steel plate lid secured with studs and cross bars.

## THE HYDERABAD CONSTRUCTION COY., LTD.

Two steel beater plates inside riveted to angle brackets riveted to shell. A dished perforated steel drainer plate fitted in side over blow-off tap, secured with studs for easy removal for cleaning.

A cast iron block riveted opposite manhole for blow-off.

Cast Iron balance weight fitted to shell opposite manhole.

Two strong cast iron trunnions riveted to opposite ends of Boiler, turned and bored, and one end arranged with Junction pipe and gland.

Two cast iron "A" stands and pedestals to be fitted to the ends, bored and fitted to the trunnions.

Worm wheel, 6 ft. diameter, teeth, 2" pitch, bored and fitted on one of the trunnions, end worm to work with same.

Worm fixing and thrust bearing fitted to large "A" stand.

One pair of fast and loose pulleys fitted to worm shaft,

One Small "A" stand and pedestal supporting and of worm shaft.

One spring safety valve attached to junction pipe.

One steam valve and internal distributing pipe.

One single gland blow-off tap.

One Air Tap.

One pressure gauge and syphon.

PRICE ..... Rs. 20,858.

### **SIZING PLANT Section 7.**

To be situated on a Structural Steel Framework above the first floor of the Beater House.

Comprising :—

*China Clay Section.*

TWO M. S. ELECTRICALLY WELDED CIRCULAR TANKS,  $\frac{1}{4}$ " plates, each 5'-0" diameter  $\times$  5'-0" deep, the first will be fitted with perforated steam coil in the bottom of the tank.

Each will have agitating gear, fast and loose pulleys, belt striking gear.

In the top section of the second tank will be fitted a brass screen to screen the fluid clay before it runs into the Tank.

# THE HYDERABAD CONSTRUCTION COY., LTD.

Each tank to be fitted with a 2½" bore sluice Valve. Tanks may be made locally.

## *Sulphate of Alumina Section.*

TWO M. S. ELECTRICALLY WELDED LEAD LINE TANKS, 4'-0" diameter × 4'-0" deep, one tank fitted with agitating gear which must be covered with lead where in contact with the Sulphate of Alumina Solution, fast and loose pulleys, belt striking gear, perforated lead pipe in first tank.

2" bore outlets to each fitted a Regulax Metal Valve.

Second Tank is without gearing and is used for supplying the Plant. liquor to flow by gravity through a 2" bore lead pipe.

## *Rosin Sizing.*

TWO M. S. ELECTRICALLY WELED TANKS, each 5'-0" × 6'-0" deep ¼" plates, one tank to have a perforated steam coil, 2" bore outlet with sluice valve.

Second Tank to have a closed steam coil to keep the size heated, with same outlet.

Tanks may be made locally.—

ONE ELECTICALLY DRIVEN HOIST to raise the materials from the ground floor to the Platform.

## STRUCTURAL STEEL STAGING.

One 10 B. H. P. MOTOR AND STARTER for driving the above, with countershafting, pulleys, etc.

PRICE ... .. Rs. 20,000

## MILL BUILDINGS Section 8.

To be constructed generally of stone Masonry Steel Trusses Sheeted with Asbestos.

## *Approximate Sizes.*

Boiler House 60'0" x 58'0', x 30'0" to Eaves.	Rs. 12,000
Power House and Turbine Foundations 40' x 30' x 30'	„ 7,500
Storage Godown for Raw Materials 100' x 40' x 20'	„ 10,000
Mechanics Shop, 100' x 40' x 20'	„ 10,000
Office and Laboratory allow	„ 15,000
	<hr/> C. O. 54,500

# THE HYDERABAD CONSTRUCTION COY., LTD.

	B. F. Rs. 54,500
Bamboo and Rag Preparing House 106' x 60' x 20'	,, 16,000
Digester House, Steel Framework, Asbestos Sheeted, 62' x 25' x 60'	,, 30,000
Bleaching and Straining House, 100' x 100' x 24' with first floor. ....	,, 40,000
Beater House, 120' x 60' x 24' with first floor.	,, 28,000
Paper Machine House 320' x 45' x 24'	,, 36,000
Finishing House and Paper Godown, 250' x 52' x 24'	,, 20,000
Soda Recovery Plant 100' x 40' x 24'.	,, 10,000
Causticising House, 60' x 40' x 30'	,, 7,200
Electro-Bleach Plant, Cell Room, 50' x 30' x 16'	,, 3,750
Concentrator House, 40' x 30' x 30'	,, 3,600
Building for salt, Soda and Absorbers will have to await laying out of the plant. ....	,, 12,000
Mechanics Shop 100' x 40' x 24'. ....	,, 10,000
	<u>Rs. 2,71,059</u>

## QUARTERS Section 9.

General Manager	Rs. 12,000
Three Assistant Managers ....	18,000
Chief Engineer ....	8,000
Three Shift Engineers ....	90,000
One Chief Chemist ....	6,000
Two Assistant Chemists ....	2,400
Thirteen Supervisors ....	10,000
Maistry's Quarters ....	20,000
Clerks ....	7,500
Workers allow ....	22,500
Weigh Bridge and Time Office ....	1,500
	<u>Rs. 1,16,900</u>

# THE HYDERABAD CONSTRUCTION COY., LTD.

## Section 10:-

Mill Fencing	Rs.	5,000
Roads, Drainage and Sanitation	....	10,000
Mill Sidings	....	5,000
Workshop Equipment allow	.. .	30,000
Water supply	....	1,00,000
Forest Railway	..	90,000
Weigh Bridges	...	7,500
	Rs.	<u>2,47,500</u>

## S U M M A R Y .

Bamboo Preparing Machinery	Rs.	11,89,277
Boiler Plant	....	4,50,000
Soda Recovery & Causticising	....	2,37,800
Electrolytic Bleach & Caustic Plant	....	2,01,000
Power plant	....	1,16,000
Rag Boiling Section	....	44,218
Sizing Plant	.. .	20,000
Buildings	....	2,71,050 .
Quarters	....	1,16,900
Mill Fencing, etc. Weighbridges	....	<u>2,47,500</u>
	Rs.	28,93,745
Add 10% for Overhead and Unforeseen	....	<u>2,89,374</u>
<b>Total Cost of Mill Erected</b>	<b>Rs.</b>	<b><u>31,83,119</u></b>

W. J. ALCOCK.